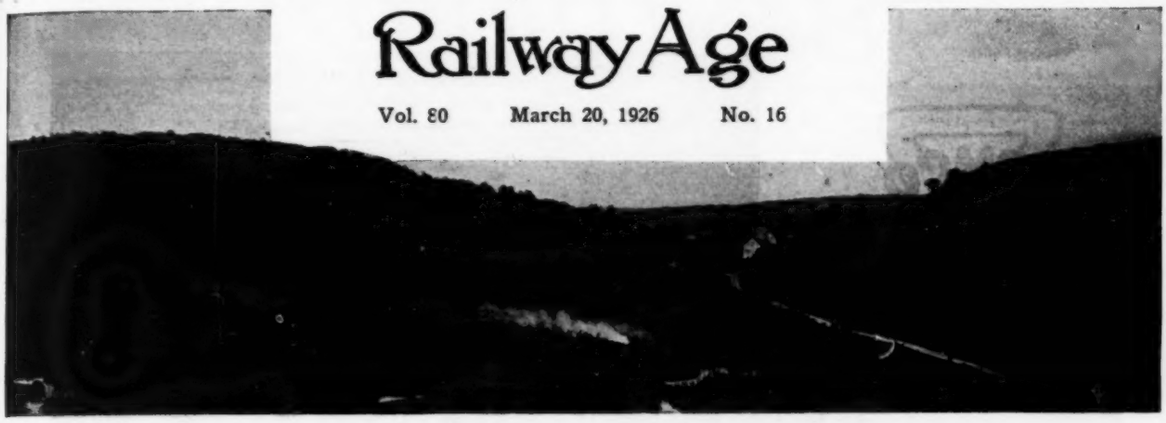
Railway Age

Vol. 80 March 20, 1926 No. 16



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Contents

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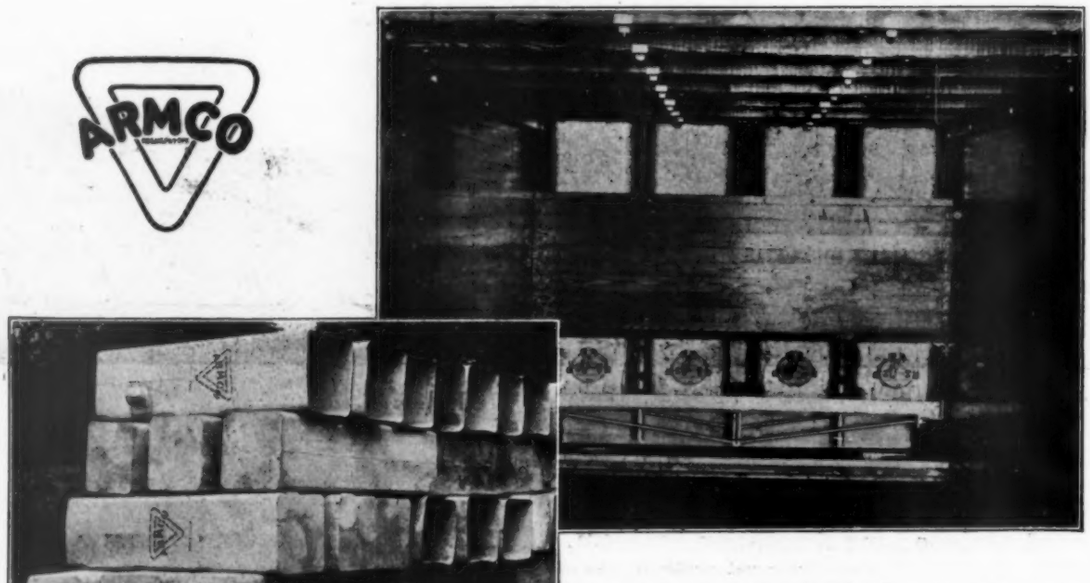

Above is an interior of a refrigerator car, showing ARMCO Ingot Iron brine tanks in use.

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Railway Age

Vol. 80, No. 16 March 20, 1926 Table of Contents Appears on Page 5 of Advertising Section

A Worthless Comparison

ONE person was killed or injured in connection with the operation of trains on American railways in 1923 to each 18,000 train-miles, whereas the number reported killed and injured in automobile accidents in the same year was only one to each 160,000 (estimated) automobile miles. A Western newspaper publishes this comparison with a view to showing that automobiles are about nine times as safe as railroad trains. This comparison has no value whatever; but to those who take such statements seriously a word of caution should be offered. The railroad passenger trains of the United States carry an average of over 60 passengers each, whereas automobiles carry an average of probably two, or three, or four persons each. Comparison of the automobile-mileage and train-mileage totals is, therefore, meaningless. Again, it must be noted that from 50 to 75 per cent of the people killed on the railroads are either trespassers, having no right to be on railroad premises, or persons struck by trains at highway crossings. Both these classes of casualties are rarely chargeable to anything but the victim's lack of care; whereas the pedestrian who is run down by an automobile can frequently put up the plea that the auto has no more right to the road than he has. Other obvious fallacies will suggest themselves.

Steam Locomotive Efficient

COMMENT is frequently heard on the fact that as compared with stationary steam power plant practice, the steam locomotive is relatively inefficient, but even taking into account the space and other limiting factors which govern the designers of steam locomotives, the overall efficiency of this type of power is not so far behind that of stationary steam plants as is sometimes thought. Recent single expansion locomotives have been built which, including the steam used in auxiliaries, will develop an indicated horsepower from the burning of 2.20 to 2.60 lb. of coal an hour. The United States Department of the Interior figures for 1923 show that public utility power plants generated slightly over 36 billion kilowatt-hours during that year at an average rate of 1.8 lb. of coal per indicated horsepower per hour, or only 18 per cent less than the locomotive figure. The figures for the best modern plants, however, are but 1.2 to 1.4 lb. of coal per indicated horsepower per hour. The real achievement of the steam locomotive designer has been in the development of machines of 4,000 cylinder horsepower, or more, within the space limitations of the right-of-way and which will stand up under the great stress occasioned by the transmission of this amount of power and movement of the entire plant on two rails, often at high rates of speed. The figures quoted above are taken from a paper presented by J. G. Blunt, mechanical engineer of the American Locomotive Company, before the American Society of Mechanical Engineers, Chicago Section, and abstracted elsewhere in this issue. The constant urge for increased locomotive power and speed is the result of a desire to cut down train hours on the road, reduce standby losses, overtime and fuel consumption, and afford increased track capacity. One railroad officer figured that the elimination of one train a day out of a total of 58 by the use of more powerful and speedy locomotives, each hauling more cars, will save his road about $70,000 annually. On this basis the total possible savings from consolidated tonnage trains may be readily appreciated.

Car Loading Figures on the Increase

FOR two consecutive weeks now the cumulative freight car loading for the year to date has exceeded that for the corresponding period of 1925, in which year the total car loading exceeded all previous records. Up to February 20 the cumulative loading was below last year's figure, but the week ended February 27 brought the total for nine weeks up to an increase of 28,463 cars as compared with the corresponding weeks of last year and for the ten weeks ended March 6 the total was 9,073,-140, as compared with 9,012,040 last year. For the five weeks ended in January the total this year was 4,432,010, as compared with 4,456,949 last year but the loading in the last four consecutive weeks has exceeded the corresponding figures for last year. The settlement of the coal strike in February and the resumption of anthracite loading brought about an increase in the week ended February 27 in the coal loading figures, and the loading of merchandise and miscellaneous freight for the year to date has considerably exceeded that of previous years.

Highway Service a Substitute Only?

RAILROADS which are entering the highway transportation fields are doing so, among other reasons, because of the pressure of competition, actual or potential, of highway carriers; because they see the opportunity to effect savings in certain places by substituting motor vehicles for more costly trains; or because they see intrinsic advantages in motor transportation itself and, as common carriers operating for a profit, wish to engage in it. These various reasons operate with varying force on different railroads, and thus we find their practice in operating the motor vehicles likewise differs. Some roads look upon the bus, not primarily as a money-maker in itself, but rather as a substitute for more costly passenger service operated at a loss. Consequently we find railroad buses which are operated, not as those of independent operators, stopping wherever passengers wish, but like trains making only station stops. Likewise we find trucks operated, not as the trucks of independent operators, making collections and deliveries, but also operating only from station to station. Other railroads, on the other

hand, which are engaged in highway transportation feel that, if they are going to be in the business at all, they must give the same kind of local and intimate service that independent operators give. There is a difference of opinion also as to whether railway motor service should parallel the railroad closely or whether it should be extended to serve communities not now reached by rail lines. Which policy should govern? Railroad experience in this field is probably yet too limited for anyone to give a final answer. The ideas of various railroad men on the subject, however, and their practice offer a field for profitable contemplation. The varying attitudes on this question are set forth in the articles in the monthly Motor Transport Section of the *Railway Age*, the second of which will appear in next week's issue.

Correction of a Misleading Statement

IN an editorial in the *Railway Age* for March 13 entitled "The Watson-Parker Bill and the Wage Situation," after the giving of statistics regarding the increases in wages asked by the conductors and trainmen, the following statement was made, "They would increase the payroll about $150,000,000 annually." This statement was misleading. What it was meant to say was that increases in wages to all employees in both train and engine service in proportion to those being asked by the conductors and other trainmen would cost the amount stated. The facts regarding the increases asked by the conductors and other trainmen were stated as correctly as possible in an article in the *Railway Age* for February 6, page 383, in which it was said: "For the train service men alone—omitting the enginemen who have not yet presented any wage demand—the increase in expense to the railroads on the same basis would be probably somewhere between eighty million and ninety million dollars.

Signals Increase Track Capacity

DEFINITE conclusions that automatic signals will increase the capacity of a busy single track road were included in the report of the Committee on Economics of Railway Operation presented at the annual convention of the American Railway Engineering Association in Chicago last week. This committee, composed principally of engineering and operating officers, made a detailed study of train operation on two different sections of a single track road, both prior and subsequent to the installation of automatic block signals and telephones, no other changes in grades, power assignment or supervision being made that would affect operation. It was found that these facilities effected a saving of 1 hr. 40 min. in road time for each train on a 66-mile section. With an average of 15.5 trains a day this made a total saving of 6,035 train hours per year.

The two principal factors contributing to this saving in time were the reduction of the spacing between following trains and the elimination of train stops for train orders. Before signals were installed trains were operated by train orders and time-tables, following freight trains being spaced by a 10-min. time interval. With automatic block signals in force any train can follow another as soon as the signal clears—in other words, as soon as the leading train has gone an average distance of 1.14 miles. Under the protection of automatic block signals it was considered practicable to eliminate the use of the form "31" order in favor of form "19," and by means of the additional help in directing train movements afforded by the signals it was found that the number of orders was reduced 50 per cent. On the 66-mile section there was a reduction of 80 train stops each day, totaling 29,200 stops a year, with an estimated saving of 7 min. per stop for a 1,500-ton train moving at an average speed of 15 miles per hour. The elimination of these train stops saved a total of 3,407 train hours a year.

The railway on which the study was made did not consider it safe to reduce the spacing between trains or to use the "19" order without automatic signal protection; therefore the signals not only increased the safety of train operation, but also increased the track capacity, as explained. In view of the fact that this report is the result of a careful study, the definite conclusion that automatic signals will increase the capacity of a busy single track line is of real significance.

Some New Problems of Grade Separation

IT goes without saying that the enormous growth of highway motor vehicle traffic has greatly intensified the demand for the separation of grades at intersections of highways with railway tracks. But what is not so generally appreciated is that the marked change in the character of highway traffic has increased the difficulty and therefore the expense of effecting separations of grade. For example, in elevating tracks or streets for the purpose of constructing a subway or viaduct at locations where the crossing forms an acute angle, resort was frequently made in past years to relocations of the street for the purpose of reducing the skew of such crossings, since this simplified the problem of constructing the subway under the tracks or the viaduct over them. This often resulted in marked reductions in the cost of such projects. As a result of the increases in the speed and density of highway traffic, the relocation of a highway which introduces a succession of reverse curves at short radius becomes decidedly objectionable if not a potential source of accidents.

A problem of even more serious nature arises where track elevation work is under consideration in locations where a street parallels the railway right-of-way on one or both sides. Here the construction of subways for the intersecting streets often results in the introduction of abutments and retaining walls which effectively obstruct the view at the street intersections just outside the right-of-way, with the result that the elimination of the dangerous highway-railway crossing is offset at least in part by an increase in the probability of accidents at the street crossing. While such street accidents, considered individually, are not usually of such serious consequence as those involving railway trains, experience has shown that they occur with greater frequency and that their prevention is usually more difficult than the protection of grade crossings with railway tracks.

Situations such as these must be carefully considered whenever grade separation projects are being urged by public authorities. Attention should be directed to the new hazards thus inadvertently introduced and suggestions offered for overcoming them. It may even be within reason to suggest that a separation of street grades is equally as urgent as the elimination of the street railway crossings. A presentation of all the factors entering into a project of this kind should lead to a more reasonable attitude on the part of public authorities when considering the problems of dangerous grade crossings.

Are Steam Roads Backward in Car Standardization?

IN a letter to the editor in this issue a friend of the electric railway industry operating in Ohio, Indiana, Michigan and adjoining states contrasts the rapidity with which the Central Electric Railway Association has developed and agreed upon a standard freight car specification with the long period during which the steam railroads have been reporting progress in their efforts to develop standard box cars without final accomplishment. The contrast moves the writer of this letter to suggest that the older brother in the transportation family might profitably emulate the performance of the younger brother.

Without the slightest intention of disparaging the accomplishment of the Central Electric Railway Association, there are several differences in the conditions involved in the two industries which must be considered before the performance of the younger brother is to be used to condemn the older brother. In the first place, the diversity of interests from a traffic standpoint involved in the membership of the American Railway Association, covering as it does the greater part of North America, is infinitely greater than in the case of the Central Electric Railway Association membership. The American Railway Association has to consider the needs of every conceivable commodity moved anywhere on land in the commerce of a continent and interchanging between three completely independent political units. The requirements of the Central Electric Railway Association, on the other hand, are limited to a relatively small area with relatively few members. Furthermore, the movement of freight is of relatively less importance to those roads than the movement of passengers, whereas the reverse is true in the case of steam railroads. Hence, the investment involved is relatively much greater in the case of the latter and each road necessarily much more deeply entrenched in the defense of its own interests than is probably the case with the electric lines.

So much for the financial and traffic phases of the problem. When the operating requirements are considered, the problem is fully as complex. To design a car reasonably well suited to the most severe conditions likely to be encountered is no great problem, but to design a car which will meet these conditions and still keep its weight limits satisfactory to roads where something less than the most severe conditions are encountered, does constitute a real problem. It must also be taken into consideration that steam railway operating conditions, severe as they now are on rolling stock, are still changing in a way to make it extremely desirable that future improvements in rolling stock shall not be hampered by a standardization devoid of a high degree of necessary flexibility.

When all these conditions have been considered, the accomplishments of the steam railroads in this matter up to the present time are not to be disparaged by comparison with any similar project undertaken by a voluntary association. Not only have coupler and truck details—the parts most frequently requiring replacement in interchange—long been effectively standardized, but a standard design of single-sheathed box car has now been in effect for a year and two standard double-sheathed, wood-sheathed box cars have now been adopted, effective March 1 this year. Adding to these the standard specifications for tank cars which have long been in force, the list of accomplishments in effecting essential standardization is one for which the American Railway Association and the individual railway officers who have been active in this work need never offer any excuses for the results so far obtained.

Railways' Entire Net in 1925 Due to Reduced Expenses

THE entire net operating income earned by the railways in 1925 was due to economies in operation effected since 1920, and only 15 per cent of the saving in operating expenses in 1925 as compared with 1920 was due to reductions in the rates of pay of employees. The small part that reductions in the rates of pay of employees since they reached their peak in 1920 has played in enabling the railways to increase the annual net return earned by them is shown by the Interstate Commerce Commission's complete statistics of wages for 1925 which became available this week.

The total earnings of the railways in 1920 and 1925 were almost exactly the same. Excluding mail pay for previous years included in the accounts for 1920, their total earnings in that year were $6,114,000,000, while in 1925 they were $6,120,000,000, an increase of only one-tenth of 1 per cent. The freight business handled in the two years was practically the same, and owing to higher freight rates for 1925 the earnings from it were greater. On the other hand, owing to a decline in passenger traffic the earnings from this source declined. The taxes paid by the roads in 1925 were $87,000,000 greater, or 32 per cent more, than in 1920.

Their operating expenses in 1920 were the highest in history, being $5,828,000,000, while in 1925 they were $4,536,000,000, a reduction of $1,292,000,000. They failed in 1920 to make total earnings sufficient to pay their operating expenses and taxes, and had no net operating income at all, while in 1925 their net operating income was $1,120,000,000. It will be seen, therefore, that their net operating income in 1925 actually was less than the total reduction in their operating expenses effected during the period of five years.

The total wages paid in 1925 were $767,000,000 less than in 1920, a reduction of 22½ per cent. The saving in 1925 due to reductions in the daily and hourly rates of pay of employees from the peak reached in 1920 was $194,000,000, or 15 per cent of the total reduction in operating expenses. The number of persons employed averaged 253,733 less; and the average employee worked 100 hours less, than in 1920. These reductions in the number of persons employed, and in the average hours they worked, effected a saving of $573,000,000, or 44.4 per cent of the total reduction in operating expenses. The reductions in operating expenses aside from those in the payroll—these being due to more efficient use of materials, fuel, etc., and to declines in the prices paid for them—amounted to $525,000,000, or 21.8 per cent, and accounted for almost 41 per cent of the total reduction in operating expenses. It will thus be seen that 85 per cent of the total reduction of operating expenses was due to economies other than reductions in the rates of pay of employees.

The increase in the net operating income of the railways actually cost the public less than nothing at all, for while their total earnings in 1925 were $6,000,000 greater than in 1920 the taxes paid by them to the public were $87,000,000 greater, the net result being an actual saving to the public of $81,000,000. If the railways of western territory had in 1925 earned an additional net operating income equal to this saving to the public due to the increase of taxes during the last five years the rail-

way system of the country, which was virtually bankrupt in 1920, would have been almost rehabilitated financially, and this rehabilitation would have been accomplished without any increase whatever in 1925 over 1920 in the amount paid by the public for railroad transportation.

The Decision on Pacific Coast Terminal Rates

THE recent decision of the Interstate Commerce Commission in the case involving proposed reductions of freight rates from the middle west to the Pacific coast has a direct bearing upon several important matters. It shows a majority of the members of the commission are not disposed to let the western lines make lower rates to Pacific coast destinations than to intermediate points to meet what the majority call "market" competition, but what is either water competition or competition the force of which is due to service being rendered and rates charged via the Panama Canal route.

Whether the commission's decision is or is not legally and economically sound, it illustrates how little justification there has been for the movement for the passage of the Gooding bill. This bill originated in the fear of certain people in the western intermediate territory that the commission would authorize the proposed adjustment of rates to be made, and the desire of Senator Gooding and other public men to capitalize this fear for their political benefit. They sought to capitalize it by seeking legislation which, where the long and short haul question was involved, would deprive the commission of the general authority it now possesses to fix reasonable and nondiscriminatory rates.

The Gooding bill would fix the relations between rates by arbitrary legislative enactment. The commission's decision has shown a complete willingness on its part to give weight to every fact and argument that could be advanced by the interests of the intermediate territory against an adjustment of rates to which they were opposed. They could not reasonably ask more. By pushing the Gooding bill they have sought to deprive the commission of authority to regulate rates affecting them in acordance with its best information and judgment. They cannot say that by this opinion the commission has not given them a "square deal." Those who believe the decision is wrong believe it has given more than a "square deal." The decision, whatever its other merits or demerits, constitutes a strong argument against the Gooding bill or any other kind of political legislation predicated upon the assumption that Congress should arbitrarily fix by law the relations between rates because the commission may fail to give the claims of some class or section adequate consideration.

The decision is a strong argument for the passage of legislation to give the commission the same regulating authority over the intercoastal water lines that it has over the railways. The situation that it leaves in existence is wholly unjust to the business interests of the Middle West and to the western railways.

The Transportation Act declares it to be the purpose of Congress "to foster and preserve in full vigor both rail and water transportation." On the one side, however, we have water carriers that are taking an increasing amount of business from competing railway lines and the force of whose competition is largely due to the fact that they use a canal which was built by taxes paid by all the people of the United States. Steamships flying the American flag are by law given a monopoly of intercoastal service in American waters. Although common carriers, their rates are subject to no regulation whatever except when made in combination with rail rates. They do not have to publish them, and they can change them when they please and make them as high or low as they like.

On the other hand are railways that never have received any financial assistance from the government for which they have not repaid it many times over. They are required to publish their rates. They cannot change them without notice to the public and the permission of the Interstate Commerce Commission. The commission's refusal in this case to authorize the railways to reduce their rates seems to have been based largely on the belief that if it did so the water carriers would immediately reduce their rates. The fact that the commission has refused to let the railways reduce their rates because, if it did so, no governmental authority could under existing law prevent the water carriers from immediately reducing their rates, and thereby defeating the purpose of the reduction in rail rates, is a striking commentary upon the existing situation. It shows that the declared policy of Congress to "foster and preserve in full vigor both rail and water transportation" is not being carried out, but that the policy actually being followed is that of so subsidizing and giving freedom of action to the water carriers and of so restricting the rail carriers, that the vigor of the former is being constantly increased at the cost fo sapping the vigor of the latter.

Another matter upon which this decision has a direct bearing is the proceeding of the western lines for a general advance in freight rates. The commission is bound to find in this case that the western lines have been for five years, and are now, earning a net operating income far less than the commission has held would be a "fair return." The general level of rates fixed for them has been, and is now, plainly confiscatory. The western railways sought to secure some increase in their net earnings by the proposed readjustment of rates to the Pacific coast, which the commission has just refused to grant. If railway officers were right in their contention that the proposed readjustment of rates to the Pacific coast would increase their net revenue, then the decision of the commission in this case has deprived them of one source of net revenue and made more imperative an early decision by it granting a general advance in western freight rates.

Commissioner Esch in his dissenting opinion, in which Commissioners Meyer and Aitchison concurred, estimated that the proposed readjustment of rates to the Pacific coast would have increased the net revenues of the western lines four or five million dollars a year. Railway officers who have thoroughly studied the subject have estimated that if the western lines were allowed effectively to compete with the coastwise steamers for traffic in general the result would be an increase in their net earnings much in excess of the amounts mentioned by Mr. Esch. If the western lines are not to be allowed to meet water competition by reducing rates than they must be allowed to get by advances in rates a larger increase in net operating income than it otherwise would be necessary to secure in this way. During the last five years they have failed by an average of $120,000,000 a year to earn what the commission itself has held would be a "fair return." If the commission rejects the means proposed by the railways for increasing their net return then it becomes its moral and legal duty on its own initiative to make the changes in rates necessary to enable them to increase it. The commission is not a court but an administrative tribunal which has imposed upon it by law the duty, among others, of so fixing rates as to enable the railways to earn a "fair return." For more than five years the

commission has failed to perform that duty to the western lines. There can be offered no defence in morals, economics or law for further failure to perform it.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Cost of Government in the United States, by National Industrial Conference Board, Inc. Volume of State and Federal taxation 1924, 1925, trend of public expenditures —federal, State, and local. Table 9, p. 50 shows net income, dividends and taxes compared for all corporations, 1923, railroads being included in "Transportation and other public utilities." 138 p. Published by National Industrial Conference Board, Inc., New York City. Price $2.00.

Metallurgy and Its Influence on Progress, by Sir Robert A. Hadfield. Interesting to laymen on account of historical section, Part I, reviewing contributions of metallurgists from Sir Francis Bacon to those of present day, and to those using steels of all sorts for its wealth of data on them. The author is inventor of manganese and many other special alloy steels. 388 p. Published by Chapman & Hall, London, England. 25 shillings for a copy.

New Zealand Official Year Book 1926, compiled in the Census and Statistics Office. "Section XIII—Railways" reviews history and present condition of railways, and gives data, page 363-364, on the Otira or Arthur's Pass Tunnel, the longest in British Empire, and 7th longest in the world. 989 p. Published by W. A. G. Skinner, Government Printer, Wellington, N. Z. 7 shillings, sixpence.

Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam, by U. S. Interstate Commerce Commission. Order by Commission and Rules and instruction by Bureau of Locomotive Inspection. Dated Dec. 14, 1925. 55 p. Published by Government Printing Office, Washington, D. C. 10 cents for single copy.

Periodical Articles

Henry Ford—Railroader, by Edward Hungerford. Results of six years of operation of the Detroit, Toledo & Ironton. Illustrations and map. Forbes Magazine, March 15, 1926, p. 9-12, 46.

The Operating Results Achieved by the Country's Railroads in 1925, by Arthur Richmond Marsh. Economics World, Feb. 13, 1926, p. 219-220.

Opportunities for Engineers in Industry, by James O. G. Gibbons. "The Engineer in Railroading," p. 262. Mechanical Engineering, March, 1926, page 261-262 inclusive.

Public Utility Valuation for Rate Purposes, by John H. Bickley. Largely a consideration of "prudent investment." American Economic Review, March 1926, p. 28-46.

The Shippers Are Sitting in the Game, by Robert S. Henry. Co-operation through Shippers' Regional Advisory Boards. Nation's Business, March, 1926, page 70-74.

Letters to the Editor

[The RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]*

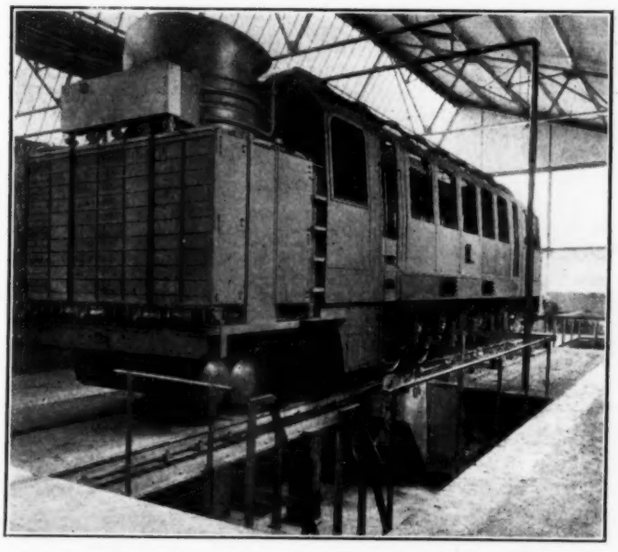
Locomotive Testing Plants in Europe

BERLIN, Germany.

TO THE EDITOR:

Lawford H. Fry, in his paper on the influence of the testing plants for locomotive designs which was presented at the regional meeting of the American Society of Mechanical Engineers, Altoona, Pa., and abstracted in the October 24, 1925, issue of the *Railway Age,* page 752, states that the locomotive testing plant is of purely American origin and that the author was unable to find a record of any real testing plant installed outside of the United States.

I am far from denying the significance of American



Interior View of the Locomotive Testing Plant at Esslingen, Germany

progress in the field of locomotive laboratory tests and especially the work of my friend, Dr. W. F. M. Goss, but for the sake of truth I would like to call your attention to the fact that the first locomotive laboratory was installed at Kieff, Germany, in 1882, by Alexander Borodin. A description of this laboratory and of the tests which were conducted therein by Mr. Borodin was published in the Proceedings of the Institute of Mechanical Engineers, London, 1886, page 317.

The laboratory in Kieff was of a temporary character and was abandoned in 1886. However, in 1906 a permanent plant on six coupled wheels was erected at the Putiloff works in Leningrad, Russia, then known as St. Petersburg. Russian technicians are indebted for this installation to the engineers Smirnoff and Bololoboff who conducted between the years 1906 and 1914, locomotive

tests, some of which have been published in the Russian language.

In 1912 it was evident that the brakes of the Putiloff plant were not capable of handling the modern locomotive and in 1913 the Russian Government set to work on a new plant at the Alexander works, now known as the Proletarian works, located near Leningrad. This plant, which is modern in every respect, was designed to serve both the needs of the Russian railroads and the Institute of Ways of Communication. War and revolution delayed, to a considerable extent, the completion of this plant and it was only in 1924 that it was placed in operation. At the present time tests are being conducted in this plant by Professor Grinenko.

The order for two Diesel locomotives in Germany required me to erect a temporary testing plant in Esslingen, Germany, which was later transferred to Düsseldorf. This plant is described in my book, "Die Dieselelektrische Lokomotive" and in my article in the "Organ für den Fortschritt des Eisenbahnwesens." It was also described in English, published in the "Engineer," 1924, page 553. The illustration shows a view of the interior of this testing plant at the time our second Diesel locomotive was being tested.

In conclusion I wish to state that with all the conveniences offered by a locomotive testing plant, it is not able to give the results of road tests. I am not speaking of trial runs of the usual type but of scientific tests on sections of track having a constant profile. This question has been, besides in my numerous works on this subject written in the Russian language, touched upon in the previously mentioned article in the "Organ für den Fortschritt des Eisenbahnwesens" and in my book "Lokomotivversuche in Russland," 1926, published by the Verein Deutscher Ingenieure.

G. Lomonossoff.

Concrete Slab Track Support Not Practical

Shreveport, La.

To the Editor:

In the *Railway Age* of December 12 there was published an article entitled "A Design for Permanent Track Construction." This brings up a subject of vital importance to railway managers, and it is to be hoped that out of the discussion that may ensue a form of permanent track will be evolved that will be within reasonable cost of construction and maintenance.

The slab plan as suggested by Messrs. Alfred and Chipman would be effective with an absolutely unchangeable foundation under the slab, but I dare say that a very small percentage of the roadbeds are not susceptible to the changes of weather conditions. Any subsidance whatever of the slab would necessitate shimming the rails, which is objectionable and much settlement would require shimming to an extent that would be impracticable.

It occurs to me that the railroad track of the future is going to be either of the type as it now exists, with the wood ties replaced by metal or reinforced concrete, or a form with stringers carrying each rail, composed either of metal or reinforced concrete, supported in turn by piles driven to an unquestioned bearing. I have referred only to a general plan, suggesting no size or form for the stringers, their reinforcement or the spacing of supporting piles, as these are all susceptible of computation suitable to different conditions.

Linton W. Stubbs.

Should Whistle Board Location Be Changed?

St. Louis.

To the Editor:

The advent of automobile traffic and the hazard engendered by the use of the automobile over public highways, together with the improved highway and the ever increasing output of automobiles, has brought about a condition with reference to the numerous costly highway grade crossing accidents which calls for more drastic effort on the part of the railroads of the country to meet, than is evident at this time.

Many years ago the whistle board was placed by law at a point 1,320 ft. from grade crossings, and, at the time this distance was established, it apparently met the needs of the times. We then had nothing but horse drawn vehicles and correspondingly slow movement over crossings. The horse drawn vehicles are insignificant now in number as compared with automobile traffic, and on our highways of today it is not uncommon for automobiles to make as great, or even greater speed, than do the trains. In many cases the automobile is farther from the crossing than the locomotive is when the signal is sounded for the crossing, and it is not heard. It would, therefore, seem to be very necessary that the whistle be sounded closer to the crossing than the present law requires. On the Missouri-Kansas-Texas Lines the second whistle is now required to be sounded at a point 500 ft. from the crossing, the same to be continued until engine has passed the crossing, and we have found from numerous tests that this has been the means of sufficient warning reaching the auto driver to prevent the accident. It seems to us that this is sufficient reason for moving the whistle post for highway grade crossings to a point approximately 500 ft. from the crossing, instead of 1,320 ft. as at present, and, inasmuch as the whistle sounded 1,320 ft. from the crossings is not sufficient warning, there seems to be no good reason for continuing to do this extra whistling. The changing of the whistle post, as suggested, would do away with half the whistling that is now required.

On a passenger run of 190 miles our enginemen are required by law and by rule to sound the whistle 1,800 times on the trip. This excessive whistling should be reduced, if possible, as it can be readily seen that an engineman, required to sound the whistle that number of times, must have his attention taken from his train orders, timetable, observance of the track, and the working of his engine, which amounts to considerable when the safety of his passengers and the operation of his train are concerned.

The location of the whistle on the locomotive is another point that should receive consideration. On most of the engines of today, the whistles are placed within 8 or 10 ft. of the cab of the locomotive, and the constant blowing of the whistle in such location is injurious to the ears of the men who ride the locomotive. Therefore, a new location for the whistle, farther removed from the cab, should be considered.

We have, for experimental purposes, placed a whistle just ahead of the smoke stack on a locomotive, so far removed from the engine cab that the enginemen are not bothered, and giving the whistle a decided range ahead that is not possible when there are obstructions ahead of the whistle, such as the steam dome, sand dome, etc. On actual test it was found that the placing of the whistle in front of the smoke stack interferes in no way in calling in flag, or for the whistle to be heard distinctly in a steel car with windows and doors closed seven cars behind the engine.

We have recently changed our highway grade crossing whistle signal from two long and two short to two long, one short, and one long, and we find this to be very beneficial, as it gives the enginemen an incentive to hold the whistle open until the crossing has been passed. The last blast of the whistle, being louder, is more effective.

A wide discussion of these important matters should be indulged in by the railroads of the country with the view of establishing their merits.

J. L. WALSH,
Superintendent of Safety, Missouri-Kansas-Texas Lines.

Grade Reduction Not Always Economical

WINNIPEG, Man.

TO THE EDITOR:

The paper entitled "Efficient Transportation Demands Modernization of Lines," by C. A. Morse, published in the *Railway Age* of January 23, 1926, is so full of good common sense and contains so little which can be criticised that I would hesitate to attempt to elaborate on it if it were not for the fact that my experience has taught me the necessity of continually guarding against the danger of going to extremes.

A very clever assistant engineer in the employ of a company for whom I was once working submitted for my approval a very elaborate study showing what enormous savings the company could make by changing from a 0.3 per cent maximum rate of grade to a maximum of 0.15 per cent on a new line of some 200 miles then under construction. The proposition died when he could not tell us how he would start his calculated train load if it should ever be stopped when going up the 0.15 per cent grade, or even on a grade of less than 0.15 per cent. The point I wish to make is that in my opinion a rate of grade of about 0.3 per cent is the lowest maximum that any sane economical study will justify.

Another engineer made surveys and recommended starting construction on his plan of changing all the grades on a long stretch of line we were double tracking. His justificatioh for the recommendation was the amount I had given him as the value of a foot in rise and fall. The maximum rate of grade in this case was 0.4 per cent, and the grade line was very choppy with no long grade and no reduction in elevation of any major summit. In my opinion it is a waste of capital to spend any money in cutting minor summits or raising minor sags which are approached by grades of less than 0.4 per cent.

This brings up another point. Your sub-caption reads "Reduction of ruling grades and maximum curvature essential to low operating costs." Literally this is true but there are cases where it would not be economical to carry this idea to a conclusion. In general the reduction of the rate of maximum grade on prairie or rolling country lines results in a reduction in distance, and also in the total amount and degree of maximum curvature while the reduction of the rate of grade in mountain location usually results in an increase in the distance and in the total amount of curvature, providing it is necessary to overcome the same amount of elevation. The problem in this case is to determine the amount we can sacrifice distance and curvature to gain reduction in rate of grade.

In the example used by Mr. Morse he figures that to gain a reduction of 78.6 per cent in the maximum rate of grade he would be justified in sacrificing 45.7 per cent in distance. This example fully answers the question and we can say in general that on long ruling grades (15 to 20 miles or more) where the distance is inversely proportional to the rate of grade it is uneconomical to reduce grades below the rate that is safe and practicable for operation in the reverse direction. The remedy in the above case is to cut out rise and fall where possible by the use of long tunnels and in that case the factor of rise and fall is important.

In the case cited by Mr. Morse (assuming that the 14,000 tons handled daily in each direction is gross tonnage) I calculate that the freight traffic alone, figuring coal on the locomotive at $4 per ton and money at 5.5 per cent, would justify the expenditure of $1,250 to eliminate one foot of elevation from a major summit.

It is probable that in the complete paper (for you published only an abstract) Mr. Morse touched all the above points and I have no doubt that he made clear the one point that might be questioned, namely, "one could afford to spend $950,000 per 0.1 per cent reduction in ruling grade."

The two important factors in train resistance are (1) The force necessary to move a train on level track, which is practically constant, and (2) overcoming the force of gravity, which is directly proportional to the rate of grade.

Where the rate of grade is low the constant is the larger factor, where the rate of grade is large the constant is a small factor. Therefore the benefits resulting from the reduction of grade are not constant; for example reducing a 0.4 per cent rate of grade to 0.3 per cent effects a 25 per cent reduction in rate of grade and a corresponding reduction in resistance of approximately 17 per cent, that is, we can figure on increasing our train load by 17 per cent. But in the case of reducing a grade from 1.40 per cent to 1.30 per cent there is an 8 per cent reduction in the rate of grade and a corresponding reduction of 6 per cent in resistance. That is, in the case cited by Mr. Morse the last 0.1 per cent of reduction in rate was worth nearly three times as much as the first.

The Chinese interpreter's version of this is "he says don't spend money in reducing maximum rates of grade below 0.3 per cent. Don't give any value to rise and fall where grades are less than 0.4 per cent.

"Regardless of the amount of traffic, reduction of the rate of grade is not always economical."

J. G. SULLIVAN,
Consulting Engineer.

Car Standardization on Electric and Steam Railways

YOUNGSTOWN, Ohio.

TO THE EDITOR:

The subject of standard box cars comes up before the steam road operating departments quite frequently, but up to date nothing definite has been done about it.

While the various committees of the A. R. A. have been "reporting progress," the Central Electric Railway Association, which is formed by the various trolley companies operating in Ohio, Indiana, Michigan and adjoining states, has actually agreed on a standard car for the various member lines and several of the companies have ordered their requirements according to the standard specification. Inasmuch as the trolley roads have a problem of weight and clearance limitations much greater than the steam roads, the work of finally adopting a standard which could be used on all lines was considerable, but they have accomplished in a short period of time that which the A. R. A. has been trying to do for many years.

It might be well for the older brother steam roads to get together and get down to business as has their younger brother electric lines, and accomplish the savings of a standard specification.

G. A. DOERIGHT, JR.

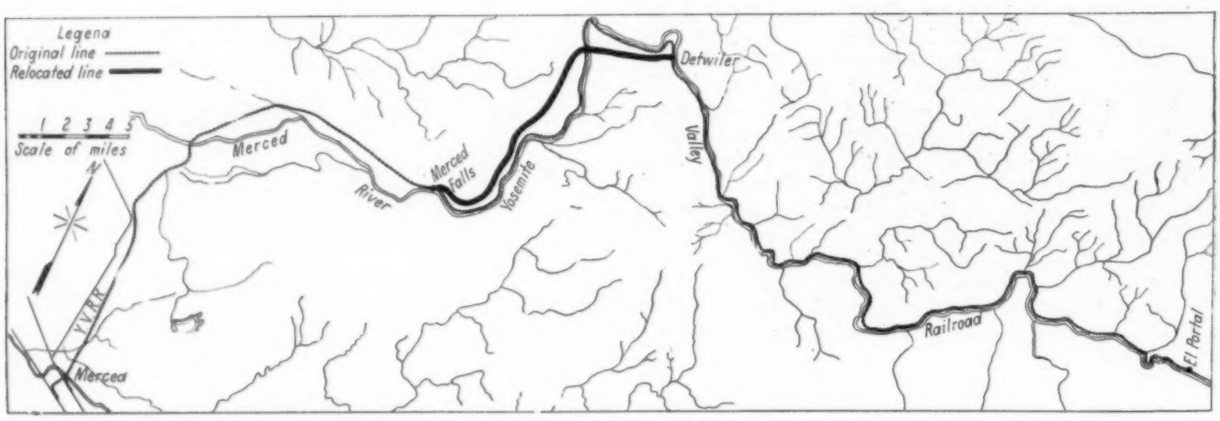
Masonry Piers 229 ft. High Ready for the Erection of the Steel

A Unique Line Relocation Problem

Yosemite Valley road rebuilds 17 *miles at cost of* $235,000 *per mile—Requires bridge piers* 229 *ft. high*

THE Yosemite Valley railroad, a standard gage line, extends from Merced, Calif., in the San Joaquin valley, to El Portal, on the western boundary of Yosemite National Park, a distance of 78 miles. From Merced to Merced Falls, a distance of 24 miles, the road lies on the eastern edge of the valley, and at the latter point enters the Merced River canyon, along the bottom of which it continues to El Portal, crossing the river twice in its ascent.

At Exchequer, seven miles above Merced Falls, the Merced Irrigation District is building a dam which will raise the water level about 300 ft. and form a reservoir extending upstream some 12 miles. In order to place the road above high water, while maintaining the same ruling grade, one per cent compensated, it was necessary to relocate the 17-mile section from Merced Falls to Detwiler. This was accomplished without increasing the total ascent, owing to the fact that there were several stretches of level and descending grade in the old line.



The Relocated Line of the Yosemite Valley Railroad in its Relation to the Entire Line

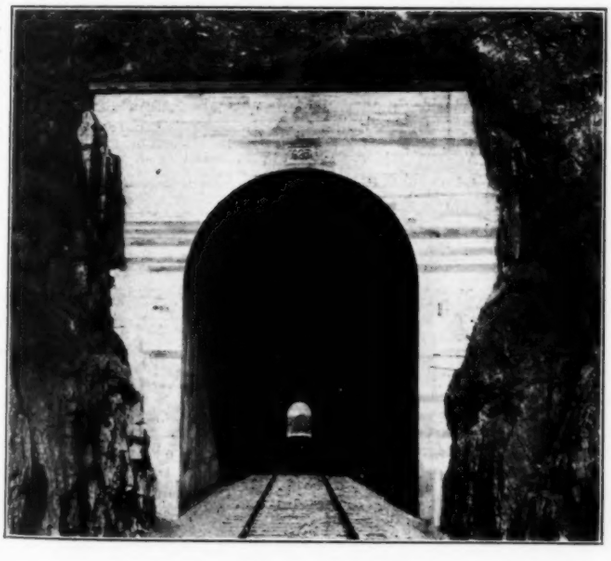
The new location threw the line into the broken country near the top of the canyon walls, along steep slopes averaging from 25 deg. to 30 deg. and entailed extremely heavy work, even with a maximum 12 deg. curve freely used. The material consisted in large part of badly contorted, seamy shale, frequently talcose, and necessitating flat slopes in excavation. The close proximity of the new

and old lines, the steep slopes and the character of the material were the causes of serious interruptions to traffic over the operated road while blasting was going on. The grading quantities totaled 1,700,000 cu. yd., averaging 100,000 cu. yd. per mile, the work being done by steam shovels, of which 13 were employed on the job at one time.

The canyon is subject to occasional heavy rain storms and there are numerous side drainages; these conditions required the installation of a large number of culverts, the smaller ones being corrugated pipe, the larger ones concrete arches. There are four tunnels on the line, the shortest being 440 ft. in length, the longest 1,673 ft., and the total length of all 3,613 ft. The excavation of these tunnels was troublesome, and timbering was required for practically their entire length. They are to be lined with concrete before the line is operated.

The most interesting structures on the new road are the steel bridges, of which there are five, aggregating 2,965 ft. in length. Four of these consist of deck girder spans ranging from 40 ft. to 110 ft. in length and supported on concrete abutments and piers from 25 ft. to 100 ft. high. The fifth bridge, which carries the road across the reservoir and is 1,599 ft. long, consists of four 80 ft. deck girder approach spans and two 634 ft. continuous through trusses, each resting on three supports. The piers supporting these trusses vary in height from 83 ft. to 229 ft.; with a full reservoir, they will be from 68 ft. to 214 ft. under water.

On account of the fluctuations of the water level in the reservoir and the consequent danger of corrosion, the piers are of plain concrete, except in the upper 13 ft. above the high water level. The high ones supporting the truss spans are of the ordinary dumb-bell section with square corners and side buttresses; the batter is variable, decreasing towards the bottom. Special care was taken in deciding on the foundation, diamond drill holes being put down to solid rock and jack-hammer holes bored over the entire area 10 to 12 ft. below them.



Typical Tunnel Construction on the Relocated Line

The concrete proportioning, mixing and placing was carefully controlled, the methods used being a combination of those of Abrams, Talbot and Fuller. The sand was inundated, water accurately measured and frequent slump tests made. The results, as regards strength, density and uniformity, have been most satisfactory and have justified the extra time and expense required over the old arbitrary method. The aggregate consisted of sand up to ¼ in., intermediate up to 1½ in., and coarse up to 2½ in.

The relocated line will be completed and ready for operation about May 1, 1926, at an estimated cost of $4,000,000. The work is being carried on by contract under the supervision of Jerome Newman, consulting engineer of the Yosemite Valley Railroad, San Francisco, California. We are indebted to W. L. White, general manager of this road, for the information contained in this article.

A Section of the Completed Track on the Relocation

W. B. Potter Addresses Western Railway Club

THE regular monthly meeting of the Western Railway Club was held at the Hotel Sherman, Chicago, on Monday evening, March 15, the speaker being W. B. Potter, chief engineer of the railway and traction engineering department of the General Electric Company, Schenectady, N. Y. Mr. Potter reviewed the developments in electric locomotives and motor cars, most of which have taken place within the past 20 years, and said that both internal combustion engine and electrical equipment have now been brought to a degree of perfection which assures highly reliable performance. He indicated that the steam locomotive, no longer supreme, is due for gradual and partial replacement by heavy electric traction systems on the one hand and electrically-driven locomotives and cars on the other where traffic and other considerations make the installation of these types of equipment economically justifiable. Diesel electric power units were mentioned as a probable development for locomotives where considerable amounts of power are involved and the fuel consumption correspondingly heavy, gasoline electric units being preferred for motor rail cars of smaller power capacity. Following the reading of the paper a series of slides were thrown on the screen showing features of construction and performance charts of the Diesel and gasoline electric locomotives and cars referred to in Mr. Potter's paper.

Briefs Filed with I. C. C. on Lease of Virginian

WASHINGTON, D. C.

BRIEFS advocating and opposing the lease of the Virginian for 999 years to the Norfolk & Western were filed with the Interstate Commerce Commission last week by the various parties to the case, on which hearings were recently concluded. The proposed lease was opposed by the Chesapeake & Ohio, the state of Virginia, the cities of Norfolk and Princeton, Va., and by R. H. Angell, on behalf of firms, corporations and individuals of Roanoke, Va., while the Chesapeake and Western asked that if the lease be approved it be on condition that it be included in the proposed combination.

The brief filed by counsel for the Norfolk & Western says that unified operation will save the expenditure of $19,200,000, which will in the near future be necessary under separate operation of the two roads, and $40,000,000 within the more distant, but easily foreseen, future, for the double-tracking of 346 miles of the Virginian from Princeton to Norfolk; that the unified operation will permit economies estimated at $2,000,000 annually in operating expenses and will result in improved service to the public. There is no carrier competition between the two lines, they say, as to coal, which constitutes seven-eighths of the Virginian tonnage.

The Norfolk & Western is described as "an independent road, independently operated, not controlled by the Pennsylvania although affiliated by stock ownership." Of the eleven Norfolk & Western directors, only four are said to be directors of the Pennsylvania, and "no question affecting Pennsylvania's stock interest has arisen except the proposal of a lease of Norfolk & Western by the Pennsylvania in 1924, when such lease was referred to committees of each road, no member of either committee being connected with the other road. The Pennsylvania's proposals were rejected by the Norfolk & Western and negotiations never resumed."

As to the objection of the Chesapeake & Ohio on the ground among others that the commission in its tentative consolidation plan assiged the Virginian to the Chesapeake & Ohio, it is stated that 60 days after the hearing on the present application began, five members of the C. & O. board of directors advised its president that they were not inclined to enter into any lease but were willing to buy the stock of the Virginian if it could be secured on desirable terms, and that nothing further had been done about it.

Among the advantages to be gained by the lease are mentioned: "Interchangeable use of tracks and sidings; balanced equipment; joint use of station buildings and other facilities; elimination of switching charges; substitution of one carrier charge for the sums of the locals; more prompt car supply; avoidance of drayage for Virginian coastwise interchange; opening of local markets on each road to local coal operations, jobbers and manufacturers situated on the other; elimination of long and short haul violations; stimulation of development of traffic through the port of Norfolk by efficiency, reduction in cost and time of service, and opening to the Virginian patrons the broad connections of the Norfolk & Western; and shorter haul on traffic to the south and west."

It is stated that "there is no foundation for the assertion that the lease would result in the abandonment of property of either carrier."

The city of Norfolk contends that "it is in the public interest that the integrity of the Virginian shall for the present be preserved," that "the proposed unification will be destructive of material existing and potential competition," that "the proposed unification (consolidation?) of the Virginian with the Norfolk & Western, which is controlled by the Pennsylvania, will result in the domination by the Pennsylvania of the anthracite and semi-bituminous coal fields of the United States, will be destructive of competition in the production and distribution of such coal, and will facilitate the formation of a monopoly in the production of such coal."

Counsel for the Virginian in their brief take the position that the attitude of the C. & O. in opposing the lease is that of the traditional "dog in the manger" and that it has not been shown that the C. & O. has any plan or proposition for acquiring control of the Virginian now or in the future if authority for the lease to the Norfolk & Western shall be refused. They say that "for all practical purposes a combination of the Virginian and C. & O. may be listed with suggested combinations of the Virginian with the New York Central or Detroit, Toledo & Ironton as merely a possibility."

"Manifestly," they contend, "the law was intended to encourage voluntary agreements involving unified operation of the properties of the carriers concerned when found to be in the public interest, with the resultant economies and other advantages. And Congress, which relieved the parties to such agreements from the operation of the anti-trust laws and of all other restraints or prohibitions by law, state or federal, cannot have intended that one proposing to enter into such an agreement, and assured of protection against governmental prosecution or restraint upon the commission's approval of the agreement, shall in an attempt to negotiate such agreement be handicapped by the knowledge of both parties that the other party is the only possible customer and is in a position to wait indefinitely for the acceptance of the terms which it imposes. If the law must be construed as requiring the commission to select for each carrier, the development of which has been arrested and the power of which to defend itself by extending its lines has been taken away, another carrier for which it shall be held until delivery is called for, the law defeats its purpose of encouraging voluntary agreements, and may become an instrument of confiscation."

Experts at Power Brake Investigation, Purdue University

Left to right, Professor G. A. Young, head of the School of Mechanical Engineering, W. S. Helmer, engineer, power brake investigation, A. R. A., A. A. Potter, dean of the School of Engineering, H. A. Johnson, director of research, A. R. A., and Professor Harry Rubenkoenig.

The Three-Cylinder Locomotive

Chicago Section, A. S. M. E., devotes annual "Railway Night" to three papers on this subject

THE regular monthly meeting of the American Society of Mechanical Engineers, Chicago Section, held at Chicago on February 24, was devoted to "Railway Night." The main subject of the evening, the three-cylinder locomotive, was then taken up by three speakers, Construction and Economy Features being considered by J. G. Blunt, mechanical engineer, American Locomotive Company; Operation by W. A. Pownall, mechanical engineer, Wabash, and Some Test Results by E. L. Woodward, western mechanical editor, *Railway Age*. Mr. Pownall's paper has been printed in a preceding issue of the *Railway Age* and abstracts from the other two papers appear below:

Construction and Economy Features

By J. G. Blunt

Mechanical Engineer, American Locomotive Company, Schenectady, N. Y.

The reciprocating engine is the most practical and economical application of steam power to a locomotive, on account of the simple and effective means it affords of transmitting power throughout the speed range of the locomotive from nothing to maximum. Accepting this, the question is to decide in what form or type will such an engine deliver the maximum combined power, speed and economy at a minimum initial cost and with the least expenditure for maintenance; in other words, what can be done to further reduce ton mile cost of transportation from the standpoint of the motive power unit. The two-cylinder locomotive has been the mainstay up to the present time but many vitally interested in this question are confirmed in the belief that the three-cylinder locomotive best answers this question for the immediate future.

The Los Angeles line of the Union Pacific System has found its two-cylinder 4-8-2 type passenger locomotives, with 54,840 lb. tractive force, not powerful enough to meet the schedules without double heading. These engines are to be replaced with three-cylinder 4-10-2 type locomotives, now on order from the American Locomotive Company, which will more than meet the demand, having a normal tractive force of 78,000 lb.

On the Oregon Short Line part of the Union Pacific System, fifteen 2-10-2 type two-cylinder locomotives, having 70,000 lb. tractive force, were purchased in 1923 to meet severe passenger schedules on a 2.2 per cent grade. These engines have no reserve power and without doubt will soon be replaced with 4-10-2 type three-cylinder locomotives which will do the work easily with ample reserve power.

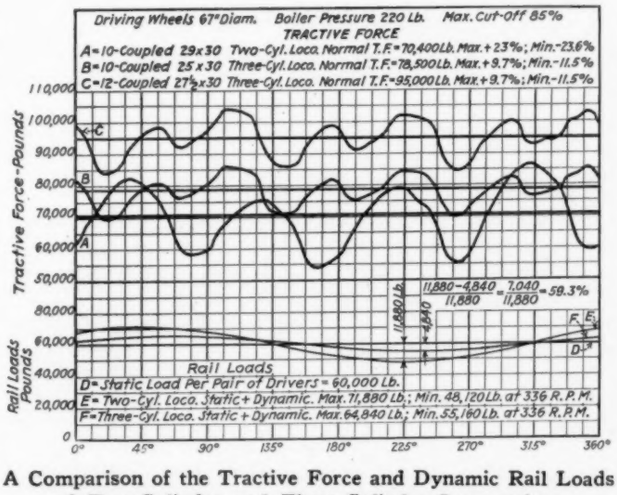
Tests have demonstrated the great power flexibility in the three-cylinder locomotive with slight changes in valve setting to meet the varying demands of starting effort, sustained power, speed and economy of fuel. With the more perfect counterbalancing, the dynamic effects on the track are calculated for the three-cylinder locomotive as a whole to be approximately 60 per cent less than in an equivalent two-cylinder locomotive. Therefore, a 10 per cent increase in static load per driving axle would seem reasonable, as the dynamic effects would, with such increase, still impose lower stresses on the track and bridges.

Sixteen Per Cent Greater Tractive Force on English Roads

The representative of a leading English railway using many three-cylinder locomotives claims to obtain 16 per cent greater normal tractive force than in equivalent two-cylinder locomotives, with no more tendency to slip and with no more weight on the coupled wheels, while the minimum starting power is 30 per cent greater. These statements apply to comparatively small locomotives where, apparently, no attempt has been made to construct the most powerful unit.

A three-cylinder locomotive is capable of more speed than a two-cylinder locomotive, due primarily to more perfect counterbalancing following the use of lighter reciprocating parts, which is very clearly exemplified in the test of a Missouri Pacific three-cylinder 2-8-2 type locomotive built by the American Locomotive Company, the test having been conducted on the Altoona testing plant of the Pennsylvania. In this test, the permissible increase in speed from the standpoint of fore and aft disturbance, due to unbalanced reciprocating parts, was 33 per cent, a very conclusive measure of possible speed increase for main line traffic.

Another most important influence on speed is the ability of the locomotive to negotiate curves, which is largely in-



A Comparison of the Tractive Force and Dynamic Rail Loads of Two-Cylinder and Three-Cylinder Locomotives

fluenced by the degree and effectiveness of the lateral resistence offered by the engine truck, trailer truck and other lateral motion or resistance devices. Generally speaking, the curving ability of a locomotive at higher speeds is best effected by means which gradually increase the resistance of each pair of truck or driving wheels leading up to or near the center of rotation of the locomotive mass in order to deliver the least severe shocks to the frame structure of the locomotive, tire flanges, rail or right-of-way. Locomotives capable of making the highest speed with safety should, furthermore, be suspended in such a manner as to maintain the maximum lateral stability against rolling.

The three-cylinder locomotive also has a marked eco-

nomical advantage over a two-cylinder locomotive because of its six exhaust impulses per revolution of driving wheels acting with a more even draft on the fire, with a given volume of gases between the top of the fire and the smoke stack.

From data contained in the Altoona test report previously referred to, the coal used per indicated hp. per hr. ran from 2 lb. to 2.4 lb., undoubtedly indicating an average fuel economy of from 10 per cent to 15 per cent under average service conditions.

H. N. Gresley, in his exhaustive paper read before the British Institute of Mechanical Engineers in July, 1925, states: "Taking the average coal consumption of 20 two-cylinder and 50 three-cylinder Atlantic type express locomotives over the entire period of 1924, conclusively shows a saving in coal of 13½ per cent in favor of the three-cylinder locomotives over the two-cylinder."

Increased Mileage Between Shoppings

Few reports are available showing the mileage between general repairs of three-cylinder locomotives compared with two-cylinder locomotives of about the same class and in similar service, but it is evidently much increased in the former due to the better counterbalance and more even distribution of power to the frame structure by having one-third of the cylinder power between the frames and ability on some types to attach the outside cylinders to other than the crank axle. Records from English roads show from 7 per cent to 25 per cent increase in favor of the three-cylinder locomotive.

In 1923, the U. S. Department of Interior showed that public utility power plants in the United States generated 36,092,000,000 kw.-hrs. from plants using coal, oil or gas, equal to 43,522,000 tons of coal. This is equivalent to 1.8 lb. of coal per indicated hp. per hr., although a few of the very latest use but 1.2 to 1.4 lb.

It has been carefully computed that the best modern two-cylinder steam locomotives will develop a drawbar hp. per hr. on an average of between 2.55 and 2.77lb. of coal exclusive of auxiliaries, and at the rate of from 2.81 to 3.11 including auxiliaries. As indicated hp.-hr. may likewise be developed for between 2.35 and 2.57 lb. exclusive of auxiliaries, or from 2.61 to 2.91 lb. including auxiliaries.

The three-cylinder locomotive will use from 2.20 to 2.60 lb. of coal per drawbar hp. per hr., exclusive of auxiliaries, or from 2.50 to 2.90 lb. including auxiliaries. An indicated hp.-hr. will be developed with from 2 to 2.4 lb. exclusive of auxiliaries and from 2.20 to 2.60 lb. including auxiliaries.

I have shown how the power and speed are increased in the three-cylinder locomotive over the prevailing two-cylinder type, each of which has an important bearing on economy of operation. It means getting the train over the road with less stand-by losses, overtime and fuel consumption, it increases the capacity of the road and exerts a powerful influence in obtaining business on a railroad where prompt delivery is essential.

Fewer Locomotives Needed to Handle Given Traffic

The greatest economy undoubtedly results from the fact that fewer locomotives and trains are required to handle a given traffic, this having a most important bearing on maintenance. One railroad officer concludes from a careful estimate that the elimination of one train per day out of a total of 58, by using more powerful and speedier locomotives of the three-cylinder type, each hauling more cars, would save his road about $70,000 annually, not counting the lessened wear and tear to the right-of-way. It is very significant what the saving would be if locomotives were used developing tractive force sufficient to eliminate several trains, consolidating their tonnage into a lesser total number, with speed sufficient to keep out of the way of other trains and off the sidings as much as possible. This phase of the question is worthy of the most serious consideration.

Experience has demonstrated that the three-cylinder locomotive reduces track stresses and maintenance. A careful check will, without doubt, also show reduced tire wear for the three-cylinder locomotive, as it has done in foreign countries. Assuming this as a fact, this should correspondingly increase the life of the rail, showing large indirect economies that would follow its more general use.

Perfection Not Claimed—Net Economy Large

No sincere advocate of the three-cylinder principle will claim perfection for it more than in other types of locomotives but careful analyses, reinforced by actual test, unmistakably indicate that the advantages to be gained far outweigh the disadvantages and afford an opportunity for effecting large economies in operating a railroad when the most powerful individual units are a factor. We are accustomed in America to embrace every opportunity for producing more efficient results; this forms the motive behind the development of the three-cylinder locomotive. With its striking advantages recognized and economies demonstrated, there should be no let-up in the determination eventually to undertake the transformation and seeing it through. From a maintenance standpoint, any departure from prevailing types of locomotives involves new responsibilities. This must be expected as in every other field of human endeavor, being easily surmounted when compared with the vast economic advantages following such a transformation.

Some Test Results

By E. L. Woodward,
Western Mechanical Editor, Railway Age

My remarks will be confined to test results recently secured on the Union Pacific under the direction of O. S. Jackson, superintendent of motive power and machinery. Three-cylinder locomotive No. 8000, with a 4-10-2 wheel arrangement, and known on the Union Pacific as the Overland type, was tested in heavy freight service against two-cylinder locomotive No. 5007 which has a 2-10-2 type wheel arrangement. Both locomotives are arranged for burning bituminous coal, being fired by mechanical stokers. The principal comparative dimensions of the two engines are shown in the accompanying table. Engine 5007 had its tires turned from 63 to 61 in. diameter and the boiler pressure increased from 200 to 206 lb., which increased the tractive effort about 6.37 per cent. All of the different comparative test runs were made over the same territories with conditions of operation as nearly identical as possible. Engine 8000 had made 20,482 miles in service before the tests were conducted and in one month made 14 round trips covering a total of 7,400 miles. In that time the engine ran an average of 239 miles a day and handled an average of 3,290 tons in each train over ruling grades as high as 0.8 per cent.

Engine 5007 was also in first class condition at the time of the tests and both locomotives were equipped with pyrometers, vacuum gages in the ash pans and smoke boxes, initial and back pressure gages and speed recorders. Accurate measurements were made of the amounts of coal and water consumed and all of the gages were read at intervals of five minutes during the test runs.

Engine 8000 handled 3,733 tons from Walcott to Percy, Wyo., 13.6 miles, over grades varying from 0 to 0.82 per cent at speeds well above those of Engine 5007 over

the same territory with only 3,226 tons. The three-cylinder locomotive also made much better time with 5,007 tons between Bitter Creek and Tipton, Wyo., than was made by the two-cylinder engine with only 4,275 tons. Other tests were made between Laramie and Rawlins, Rock Springs and Wamsutter, and between Thayer Junction and Wamsutter, all in Wyoming. Data obtained from these runs are shown in the tables. On one of the trips between Laramie and Rawlins, a distance of 117 miles, Engine 8000 made an average speed of 23.9 miles an hour, with 114 cars and 3,498 tons, taking 4 hr. 53 min. running time for the trip. The amount of coal burned was 35,382 lb., or 86.7 lb. per thousand gross ton miles and the amount of water used was 183,780 lb., or 5.19 lb. of water per pound of coal. On a similar run Engine 5007, with only 86 cars and 2,954 tons, made 20.5 miles an hour on the average, and took 5 hr. 40 min. for the trip. The coal consumption was 35,604 lb., or 107.5 lb. per 1000 gross ton-miles and water consumption was 195,650 lb., or 5.5 lb. of water per pound of coal. In other words, on this particular 117-mile run Engine 8000 hauled 28 more cars and 544 more tons in 47 min. less running time than that taken by Engine 5007, achieving this result with 19.4 per cent less coal per 1000 gross ton-miles and 5.6 per cent less water per pound of coal.

PRINCIPAL PROPORTIONS OF ENGINES TESTED

	3-Cylinder, No. 8000	2-Cylinder, No. 5007
Cylinders, diameter and stroke	1 25 in. by 28 in.; 2 25 in. by 30 in.	29½ in. by 30 in.
Weight of engine	405,000 lb.	370,200 lb.
Weight on drivers	288,500 lb.	288,250 lb.
Tractive power	78,000 lb.	74,941 lb.
Diameter of drivers	63 in.	61 in.
Valve gear	Walschaert	Walschaert
Superheater	Type A	Type A
Stoker	Elvin	Duplex
Diameter of boiler, smallest	87⅞ in.	88 in.
Boiler pressure	210 lb.	206 lb.
Firebox, length	126 in.	126 in.
Firebox, width	96 in.	96 in.
Grate area	84 sq. ft.	84 sq. ft.
Tubes, number and diameter	250—2¼ in.	260—2¼ in.
Flues, number and diameter	50—5½ in.	45—5½ in.
Length, tubes and flues	23 ft. 6 in.	22 ft. 0 in.
Heating surfaces:		
Firebox and combustion chamber	362 sq. ft.	336 sq. ft.
Tubes	3,497 sq. ft.	3,360 sq. ft.
Flues	1,685 sq. ft.	1,620 sq. ft.
Arch tubes	28 sq. ft.	32 sq. ft.
Total	5,572 sq. ft.	5,348 sq. ft.
Superheating	1,505 sq. ft.	1,165 sq. ft.

A comparison of the other results secured indicates that on the average Engine 8000 handled 18.8 per cent more tonnage than Engine 5007 and on a thousand gross ton mile basis consumed 90.9 lb. of coal as compared to 105.6 lb. for the two-cylinder locomotive, or 16.2 per cent less.

An examination of the locomotive at the time of the test disclosed that the driving box bearings were in good condition, not pounding, and that all brasses were tight in the boxes. All main and side rod bearings were found in good shape and no new brasses had been applied. The bearing in the back end of the inside main rod was removed for inspection after it had run 7,064 miles. A new brass was applied which had been run 12,342 miles and it is estimated that the original rod brass, when reapplied, will run an additional 6,000 or 7,000 miles. The bearing in the front end of the inside main rod had worn 1/64 in. at 12,000 miles, all of which tends to indicate that the more even turning moment of the three-cylinder engine aids in the operation of driving rod and driving box bearings over an extended period of time.

THE CHICAGO & NORTH WESTERN in recognition of a local boosters' organization at Omaha, Nebr., composed of merchants, has named one of its fast freight trains operating between Chicago and Omaha the "Ak-Sar-Ben." The fast freight train from Omaha to Chicago has been named the "Fort Dearborn."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 6 went far above the figures for the corresponding weeks of previous years, amounting to 964,681 cars, an increase of 32,637 cars as compared with last year and of 35,300 cars as compared with 1924. This was the second consecutive week this year in which the cumulative figures for the year to date exceeded those of last year. Increases as compared with the corresponding week of last year were reported in all districts except the Northwestern and in all classes of commodities except grain and grain products, forest products and ore. The largest increase was in coal loading, which amounted to 182,443 cars, or 17,840 cars more than that for the corresponding week of last year, while miscellaneous freight showed an increase in 14,782 cars. The summary, according to railway districts and commodities, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING

Week ended Saturday, March 6, 1926

DISTRICTS	1926	1925	1924
Eastern	235,620	218,495	227,752
Allegheny	196,627	189,893	194,504
Pocahontas	50,015	42,602	43,469
Southern	159,121	156,226	148,995
Northwestern	115,661	119,446	120,353
Central Western	140,553	139,672	132,971
Southwestern	67,084	65,710	61,337
Total Western Districts	323,298	324,828	314,661
Total All Roads	964,681	932,044	929,381
COMMODITIES			
Grain and Grain Products	40,254	44,220	46,288
Live Stock	29,540	28,236	31,159
Coal	182,443	164,603	169,792
Coke	14,967	12,806	14,324
Forest Products	75,727	81,631	83,588
Ore	10,172	10,276	11,063
Mdse., l. c. l.	264,239	257,715	250,623
Miscellaneous	347,339	332,557	322,544
March 6	964,681	932,044	929,381
February 27	912,658	864,096	944,514
February 20	931,743	925,886	845,699
February 13	917,144	903,935	935,589
February 6	914,904	929,130	906,017
Cumulative total ten weeks	9,073,140	9,012,040	8,855,470

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended March 6 were 1,901 cars lighter than the previous week, grain loading showing a decline of 1,028 cars and coal a decrease of 903 cars. Merchandise loadings were heavier by 861 cars and livestock increased 322 cars. Compared with the same week last year loadings were heavier by 2,071 cars, the largest increase being 848 cars in merchandise and 829 cars in miscellaneous freight service.

	Total for Canada			Cumulative Totals to Date	
COMMODITIES	March 6 1926	Feb. 27 1926	March 7 1925	1926	1925
Grain and grain products	5,880	6,908	6,215	67,063	59,742
Live Stock	2,132	1,810	2,270	18,052	20,423
Coal	3,745	4,648	4,149	46,331	51,962
Coke	316	712	338	4,886	2,852
Lumber	3,339	3,356	2,861	27,531	25,656
Pulpwood	3,702	3,927	3,535	36,483	37,389
Pulp and Paper	2,644	2,820	2,409	24,272	19,772
Other Forest Products	3,743	4,087	3,511	32,511	30,586
Ore	1,457	1,442	1,276	12,911	10,356
Merchandise, l. c. l.	15,619	14,758	14,771	129,903	124,334
Miscellaneous	11,086	11,096	10,257	95,584	88,286
Total cars loaded	53,663	55,564	51,592	495,527	471,358
Total cars received from connections	39,821	36,973	33,186	319,811	305,479

The freight car surplus on the railroads of the United States for the period March 1 to 7 averaged 202,432 cars, including 84,135 box cars and 72,949 coal cars. The Canadian roads for the same period had a surplus of 25,760 cars, including 20,250 box cars and 200 coal carrying cars.

Wage Statistics for 1925

WASHINGTON, D. C.

THE Interstate Commerce Commission has issued a compilation of wage statistics for Class I roads, including 18 switching and terminal companies for the twelve months ended December 31, 1925, a consolidation of the twelve monthly summaries of wage statistics issued during the year 1925, except for certain minor corrections.

The total number of employees reported by Class I railroads for the year 1925 averaged 1,769,099, a decrease of 8,292, or 0.5 per cent, as compared with the average number reported for the preceding year. Owing to a slight increase in the average number of hours worked by employees reported on an hourly basis, coupled with an average increase in their straight-time hourly earnings of 7 mills, and 1.1 cents in overtime earnings, the total compensation increased from $2,867,564,802 in 1924, to $2,900,107,384 in 1925, or 1.1 per cent, and in consequence the average annual earnings per employee increased from $1,613 in 1924 to $1,639 in 1925, or 1.6 per cent. The ratio of overtime compensation to total compensation decreased from 6.04 per cent in 1924 to 5.92 per cent in 1925.

AVERAGE STRAIGHT-TIME EARNINGS PER DAY OR HOUR—BY EMPLOYEE GROUPS

Group	Basis of reporting	United States 1925	1924	1923	1922
Executives, officials and staff assistants	Daily	$16.69	$16.47	$16.17	$15.92
Professional, clerical and general	Daily	7.05	6.98	6.85	6.74
	Hourly	.584	.579	.566	.564
Maintenance of way and structures	Daily	9.10	8.95	8.92	8.86
	Hourly	.431	.429	.422	.416
Maintenance of equipment and stores	Daily	8.95	8.86	8.81	8.85
	Hourly	.592	.586	.574	.584
Transportation (other than train, engine and yard)	Daily	3.32	3.28	3.24	3.24
	Hourly	.544	.541	.529	.529
Transportation (yardmasters, switch tenders and hostlers)	Daily	8.54	8.51	8.43	8.45
	Hourly	.646	.629	.608	.606
Transportation (train and engine)	Hourly	.781	.763	.736	.736

The greatest increase in average hourly earnings was received by employees in the train and engine service group, the increase being 2.4 per cent for straight time and 2.8 per cent for overtime.

The total compensation of employees paid on the piece-work basis amounted to $72,785,087 in 1925, as compared with $63,276,407 in 1924. The average earnings per hour of piece-work employees increased from 81.3 cents in 1924 to 82.1 cents in 1925.

The subjoined tables show, for employee groups: (1) the average number of employees for 1925; (2) the average annual earnings per employee for 1925 and for the three preceding years; (3) the average straight-time earnings per day or hour for 1925 and for the three preceding years.

AVERAGE NUMBER OF EMPLOYEES AND AVERAGE ANNUAL EARNINGS, BY EMPLOYEE GROUPS

Group	Basis of reporting	1925	Average annual earnings 1925	1924	1923	1922
Executives, officials, and staff assistants	Daily	16,510	$5,296	$5,227	$5,120	$5,029
Professional, clerical and general	Daily	51,624	2,203	2,188	2,147	2,115
	Hourly	230,521	1,497	1,487	1,463	1,474
Maintenance of way and structures	Daily	4,751	2,917	2,882	2,863	2,835
	Hourly	385,743	1,083	1,068	1,085	1,038
Maintenance of equipment and stores	Daily	17,026	2,966	2,943	2,922	2,928
	Hourly	507,486	1,487	1,470	1,513	1,604
Transportation (other than train, engine and yard)	Daily	26,740	1,186	1,175	1,157	1,153
	Hourly	181,806	1,492	1,479	1,451	1,446
Transportation (yardmasters, switch tenders and hostlers)	Daily	6,878	3,111	3,099	3,060	3,066
	Hourly	17,236	1,849	1,805	1,764	1,763
Transportation (train and engine)	Hourly	322,778	2,357	2,294	2,283	2,224
Total (all employees)	Daily	123,529	$2,579	$2,551	$2,518	$2,474
	Hourly	1,645,570	1.569	1,544	1,556	1,558

Bureau of Signals Comments on D. C. H. Installation

WASHINGTON, D. C.

THE Interstate Commerce Commission has made public a letter addressed by E. H. DeGroot, Jr., director of the Bureau of Signals and Train Control Devices, to J. T. Loree, vice-president of the Delaware & Hudson, regarding the preliminary inspection of the installation of the intermittent inductive type of automanual train stop device of the General Railway Signal Company on the 20.1 mile single track section between Plattsburg and Rouses Point, N. Y., and as a result of this inspection, the following criticisms and comments are offered:

1. The track inductor as located and fastened makes displacement or removal unlikely, and it is, therefore, believed that the employment of detectors is not required on this installation.

2. The closing of the inductor winding results in a clear operation of the device; hence a cross in the wires leading to this winding would result in a false clear condition of the inductor. It is therefore vital that the installation and maintenance of the track inductor circuit shall be such as to protect the integrity of this circuit.

3. Since certain crosses in the locomotive circuits could result in false clear operations, it is obvious that the integrity of these circuits must be protected.

4. During the inspection it was noticed that the conduit piping at the rear of the tender near the equipment box was installed in such manner that the conduit and fittings would be submerged should water accumulate there. Your representatives state orally that this has been corrected.

5. It was observed during the inspection that enginemen forestalled when passing outbound over test inductors, but had no test for an automatic brake application. As will be appreciated, the latter is the more important test and you may desire to consider having this test made.

"The object of this and other preliminary inspections is that of constructive criticism; the pointing out of such matters as may be helpful to the carrier in checking an installation against the specifications and requirements of the commission's order and comments concerning such other related points as our necessarily brief inspection may develop. The foregoing criticism and comments are offered accordingly. They are not intended, nor are they to be taken either as condemnation or approval of this or any other device in connection with which they or similar criticisms may be offered. Further, this letter is not to be taken as an act of the commission."

SAFETY-ALL-THE-YEAR—and every year, is the motto of the Safety department of the Atlantic Coast Line. It is proposed to classify accident records so that the items will show where, why, when and to whom accidents occur. A recent A. C. L. circular says: "While no effort will be spared to remedy unsafe conditions, the future emphasis of the safety work of the railroads must be placed upon making the minds of men safe for machinery, instead of making machinery safe for men's minds. Workers with careless habits must be displaced by men to whom carefulness has become second nature."

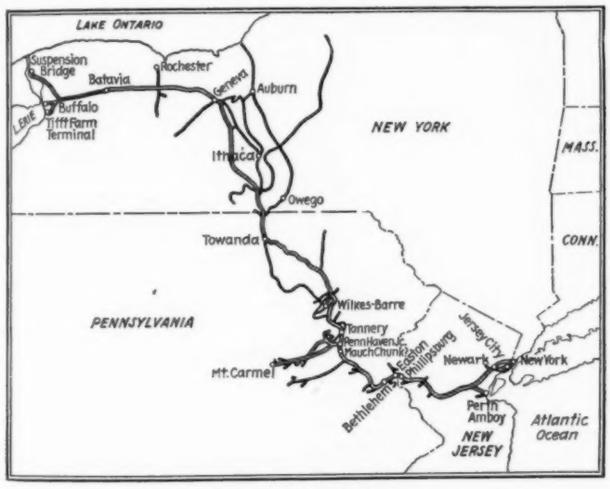
Lehigh Valley Prospers Without Coal Earnings

In spite of four months loss of coal traffic earns
13.30 *per cent on stock in* 1925

THE management of the Lehigh Valley was sufficiently enterprising to be able this year to make its annual report public as early as March 5. Several other companies had mailed to stockholders preliminary tabloid reports before this date but to the Lehigh Valley belongs the praiseworthy distinction of being the first large road—and first by a very fair margin of time—to give its stockholders the complete figures of operation in 1925.

The Lehigh Valley management had good reason to publish its 1925 operating results promptly. The operating results, in short, were extremely good and particularly good in view of the fact that in the last four months of the year the road was deprived of its basic traffic as a result of the suspension in anthracite coal mining.

The report shows net corporate income after interest and other charges of $8,046,564 and earnings of $6.65



The Lehigh Valley

or 13.30 per cent on the $50 par value $60,501,700 outstanding common stock. In spite of the coal strike, net was better in 1925 than in 1924. In 1924 the net corporate income was $7,350,975 and the earnings per share $6.08, or 12.15 per cent.

It is striking enough that the Lehigh Valley should have been able to increase its new corporate income in spite of the loss of four months' revenue from the carriage of anthracite coal and a reduction in its annual revenue from this traffic of more than $5,000,000. As important as it may be, however, there is another feature that completely overshadows it. This is that by its excellent 1925 results the road has amply demonstrated that it can prosper and continue to earn its dividends even without the sustaining power of the earnings from its coal properties. These included the Lehigh Valley Coal Company and Coxe Brothers & Co., Inc. The former was segregated in 1924 and the latter probably will be disposed of this year. Prior to 1917, the railroad company received little or no dividends from its coal subsidiaries. The adverse conditions surrounding railroad operations during the war and thereafter compelled the railroad company to draw heavily upon the coal companies' earnings. As can be seen from the last column of Table I, the 1925 net corporate income or net after charges was not as great as in 1917, 1921 or 1923. Exclusive of the coal company dividends, however, it was the largest in the company's history, which result is certainly satisfactory enough for a year during four months of which the road's basic traffic was not forthcoming.

Some Pessimistic Prophecies in the Past

When the segregation of the coal properties was imminent there were various dire prophecies that the Lehigh Valley could not continue prosperous or succeed in maintaining its dividends without its coal properties. As results thus far appear, it looks as if the pessimists had indeed come far from the mark.

The anthracite areas served by the Lehigh Valley are in the Wyoming, Lehigh and Schuylkill districts. The first is in the neighborhood of Wilkes-Barre. The other two are served by the Mahanoy and Hazelton division, which includes the net work of branch lines extending from the main line at Tannery and Penn Haven Junction. Normally, anthracite has constituted about 40 per cent of the road's total revenue tonnage and supplied about 30 per cent of its revenue. These ratios tend to decrease because of the more rapid growth of the traffic in other commodities. The Lehigh Valley is the second largest carrier of anthracite coal but ranks first in the volume of domestic sizes.

Unlike some of the other anthracite carriers the Lehigh Valley seems to have been built as a railroad enterprise rather than as a transportation facility in connection with coal operations. It originated in 1846 as the Delaware, Lehigh, Schuylkill & Susquehanna. The present name dates back to 1853. The main line in Pennsylvania, between Easton and Wilkes-Barre, was completed in 1855, and from Wilkes-Barre north to the New York state line in 1869. The road first reached tidewater at New York through a lease of the Morris Canal extending across New Jersey from Phillipsburg, N. J., to Jersey City but in 1875 it completed a railroad across the state in the form of the Easton & Amboy. The Morris Canal has now been abandoned but the railroad retains the canal terminals at Phillipsburg and in New York harbor. The Lehigh Valley Coal Company was acquired in 1875 following a reorganization of the former Green Land Company. Various other coal companies and coal properties were acquired from time to time later and turned over to it. In November, 1905, the railroad company acquired Coxe Brothers & Co., Inc., which under other names dates back to 1882 and at the time of its acquisition one of the largest of the independents.

Segregation of the Coal Subsidiaries

The railroad company owned all of the stock of its two coal subsidiaries and their tonnage contributed about 75

per cent of all the anthracite which it handled. The Lehigh Valley Coal Company stock totaled $9,465,000 and that of Coxe Brothers & Co., Inc., $2,910,150. In 1912 the Lehigh Valley Coal Sales Company was established and set off to meet the requirements of the Hepburn Law. Beginning in 1914 the government started suit against the railroad alleging that ownership of its coal properties was in violation of the Sherman anti-trust act. The case was carried through the courts with an unsuccessful outcome for the railroad. Finally, in 1923, a plan was agreed upon covering a divorce of the railroad and coal companies, and a court decree was entered for carrying it into effect. This was effected as concerns the Lehigh Valley Coal Company in 1924. Trustees appointed by the court bought all the rights of the railroad company in the stock of the Lehigh Valley Coal Company and stockholders of the railroad were given by the trustees the right to subscribe at $1 per share for one certificate of interest in the coal company stock for each share of railroad stock owned. The coal company created a 5 per cent sinking fund mortgage issue totaling $40,000,000 of which $15,000,000 was sold and the proceeds ($14,968,925) turned over to the railroad. The remaining $25,000,000 was reserved for refunding coal company bonds but it is estimated that only $6,500,000 will remain at maturity in 1933. This results from the sinking fund provisions which are in the form of an allowance for each ton of coal mined. There were various complicated provisions intended to deter holders of railroad stock from being also owners of the coal company certificates of interest. The necessity of having such certificates resulted because the stock of the coal company was pledged as part of the security for a Railroad Company bond issue which does not mature until 2003. The Coal Company certificates pay dividends of $2.50 annually and are now quoted on the New York Curb Exchange market at $40.

The provisions relating to Coxe Brothers & Co., Inc., called for the lodging of the voting power of the stock in the hands of trustees appointed by the court and for sale of the coal company at a date subsequent to February 1, 1926, when the collateral trust agreement under which the stock was pledged matured. The government asked for the separation of the railroad known as the Delaware, Susquehanna & Schuylkill, formerly a Coxe Brothers subsidiary, but the railroad was later allowed by the Interstate Commerce Commission to take this over under a lease and to continue to own all the stock.

Features of Recent Development

The history of the Lehigh Valley Railroad in recent years under the skillful guidance of its present management has been the manner of preparation for the time when it would no longer have the financial assistance embodied in the earning power of its coal properties. The development has been along various lines. For one thing the road has carefully and assiduously built up a prosperous and expanding general freight traffic, cultivated particularly by a high grade time freight service. The Lehigh Valley classifies its coal ton miles and its "merchandise" (traffic other than coal) ton miles separately. From the figures given in Table I it will be noted that the coal ton miles have tended rather to decrease than to increase but that the merchandise ton miles have shown a healthy growth. The really interesting detail is lacking in this table. Such is the increase in the item in the commodity tonnage classification statement of "Other manufactures and miscellaneous." This item first appeared in the annual report of 1920. The tonnage under this classification in 1925 was considerably over twice what it was in 1920. In 1925 it constituted 13.37 per cent of the road's total revenue tonnage. Manufactures and miscellaneous as a whole constituted 31.38 per cent in 1925.

The Lehigh Valley is among the few roads which will show an increase in passenger revenues for 1925. It has carried on a consistent advertising campaign in the daily newspapers in regard to its service between New York and Philadelphia and Ithaca, Rochester, Buffalo, Toronto, Detroit, Chicago and the other points to which it operates through sleeping cars. The increase in passenger business amounted to 4½ per cent compared with 1924.

Another feature to which the road has paid particular attention has been the track structure. Results are indicated by a few statistics. At the end of 1925, 73 per cent of all ties in Lehigh Valley tracks were creosoted while 74 per cent of the main line was laid with 136-lb. rail. In 1924 and 1925 over 198 miles of rail of that weight was put in track, the rail laid being of the new 39-ft. length instead of the former 33. Such standards are the highest of any.

Terminals

The Lehigh Valley is particularly noted for its terminals both as relates to present development or to future possibilities. In New York harbor, the road has acquired a large water front area known as its Claremont terminal. The development of this area is only in its beginning. It will supplement the terminals on the Morris Canal basin which opens directly on the Hudson river and the extensive coal handling facilities at Perth Amboy. The feature of the Claremont terminal will be its unusually large piers readily accessible to ocean-going vessels which when completed will afford 5½ miles of docking space for the largest ships. Among the important classes of traffic at present moving through it is iron ore coming in by ship and consigned to the steel plants at Bethlehem, Pa. Various other commodities are being handled from cars to ship and vice versa. At Buffalo, the Lehigh Valley was sufficiently foresighted to acquire a large tract at Tifft Farm, with more than a mile of Lake Erie waterfront. Each annual report has new notations of additional developments at this point. In 1925, for instance, a 1,200,000 bu. grain elevator was built on land purchased from the railroad in this district and already the owners have let contracts for increasing the capacity of the elevator by 75 per cent. In 1924 a 95-acre site for industrial development, known as the Fitzpatrick Farm, was acquired in a growing manufacturing section adjacent to Newark, N. J., and Irvington.

Since Federal control the Lehigh Valley has engaged in an unusually extensive and intensive equipment rehabilitation program. As related to new equipment the road will receive shortly 1,100 new freight cars ordered in 1925. It was one of the first roads to use three-cylinder locomotives and now owns six. It is of most striking interest that the Lehigh Valley pays for its equipment from current funds. It has no equipment trust certificates outstanding. The road has now completed one of the most extensive car rebuilding programs carried on by any railroad. Thus since Federal control it has retired some 15,000 cars. In fact, it owned at the end of 1925, 30,568 cars whereas at the end of 1918, its freight car ownership totaled 43,000. In addition some 26,000 cars have been rebuilt.

The report indicates the management is keenly alive to the advantages to be gained by the use of gasoline motor cars as a substitute for steam passenger trains and also to the use of motor trucks on the highways, in place of local freights, and also in inter-terminal service. The company now owns seven motor cars and one trailer and is constantly studying the situation to determine where additional equipment of this character may be used to

advantage. It has various contracts with owners of motor trucks for the handling of freight and it is stated that during 1925 these motor trucks traveled a distance of 41,686 miles and handled 13,087,734 lb. of freight.

The Lehigh Valley is unquestionably equipped to operate efficiently and very much more efficiently than was possible before the present management took hold. Unquestionably also, it would be in a position to handle considerable more traffic than it is handling today without proportionate increase in the costs of operation. It is not surprising, considering the road's advantages, that great difficulty has been found in allocating the road in the country's consolidation plan. There is so much rivalry among those systems which realize its advantages that agreement among them as to which shall take it has been difficult.

TABLE I—LEHIGH VALLEY OPERATING RESULTS, SELECTED ITEMS, 1916 TO 1925

Year	Mileage	Revenue Ton Miles Coal	Revenue Ton Miles Merchandise	Revenue Passenger Miles	Revenue Per Ton Mile-Cents	Total Operating Revenues	Total Operating Expenses	Net Operating Revenues	Operating Ratio	Net Railway Operating Income	Net After Charges
1916	1,444	2,643,811,000	3,481,757,000	243,030,000	.650	48,859,909	34,764,977	14,094,932	71.15	.....	7,827,771
1917	1,443	2,850,619,000	3,579,816,000	243,924,000	.670	53,358,446	41,826,166	11,532,280	78.39	.....	9,688,471
1918	1,441	2,886,241,000	4,032,809,000	270,388,000	.770	66,788,903	57,926,977	8,861,926	86.73	6,821,131	6,763,406
1919	1,448	2,527,604,000	3,252,879,000	262,693,000	.893	65,542,502	60,309,198	5,233,304	91.68	3,776,291	—2,559,556
1920	1,448	2,638,248,000	3,689,266,000	278,186,000	.971	75,223,862	80,315,096	—5,091,235	106.77	—6,779,615	1,596,964
1921	1,449	2,345,211,000	2,768,080,000	235,536,000	1.220	74,997,799	67,238,068	7,759,731	89.65	5,582,216	10,050,798
1922	1,373	1,415,578,000	3,042,517,000	218,630,000	1.135	62,418,889	59,023,940	3,394,949	94.56	590,084	—1,991,247
1923	1,374	2,482,542,000	3,233,942,000	232,364,000	1.104	75,935,154	66,754,214	9,180,939	87.91	6,573,120	8,586,613
1924	1,375	2,083,381,000	3,646,575,000	253,566,000	1.109	76,374,805	60,967,969	15,406,837	79.83	11,391,549	7,352,038
1925	1,370	1,587,914,000	3,830,053,000	273,153,000	1.121	74,430,573	57,433,390	16,997,183	77.16	12,494,980	8,046,564

Note—Standard return for operations during federal control $11,318,714.

The 1925 Results

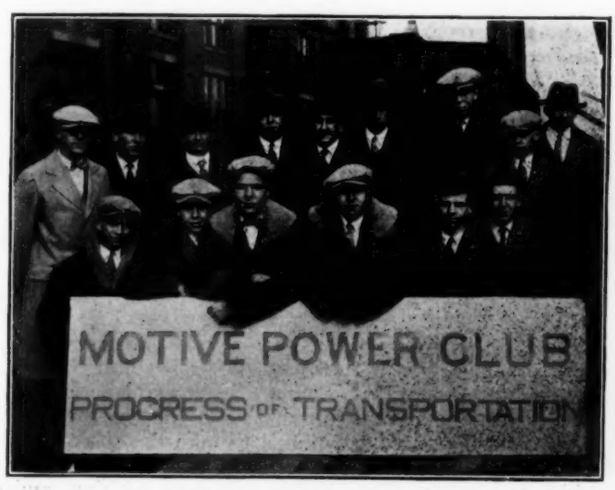
In conclusion, a few brief notes concerning the results in 1925. The anthracite traffic which in 1924 constituted 40.73 per cent of the revenue tons and supplies 30 per cent of the operating revenues, constituted in 1925, only 32.75 per cent of the tons and supplied only 24 per cent of the revenues. The reduction in anthracite revenues was $5,259,463 or 23 per cent. The loss was roughly $1,500,000 a month for the four months affected, which loss was partly made up by increased tonnage moving in the summer in anticipation of the stoppage of mining. There were increases in the merchandise freight and passenger revenues. The decrease in total operating revenues was $1,944,232 or 2.55 per cent. As against this, however, there was a decrease of $4,534,578 in operating expenses, or 5.8 per cent. Of this decrease $2,698,654 was in maintenance of equipment and $1,197,217 in transportation expenses. The decrease in the maintenance of equipment expenses amounted to 14.5 per cent and reflects nothing else than the completion of the rehabilitation program previously mentioned. It was not the result of the coal strike, as is readily indicated by the fact that the maintenance of equipment expenses for the last four months of the year were slightly more—about $5,000—rather than less than those in the first four months. The 1925 net operating revenue—revenue less expenses—totaled $16,997,183 as compared with $15,406,837 in 1924, an increase of $1,590,346. The 1925 operating ratio was 77; that of 1924, 80.

Because of increased taxes and a slight increase in the debit hire of equipment balance, undoubtedly due to the coal-strike, the whole amount of the increase in net operating revenues was not carried down to net railway operating income or net after equipment and joint facility rents. More exactly this totaled in 1925, $12,494,980, as compared with $11,391,549 in 1924. The 1925 net railway operating income was the best reported since the beginning of Federal control and, in fact, was nearly double that of any previous year (except 1924) since 1917. It compared with the standard return or average annual net operating income for the three years ended June 30, 1917, of $11,318,714 showing an increase of 13.2 per cent. Had it not been for the coal strike the Lehigh Valley earnings would have readily broken all previous records of earnings even as compared with years in which there were large dividends received from the coal properties. And yet it was said that the road could not maintain its own 7 per cent dividends without its coal subsidaries.

The usual statistics—Table II—do not need extended comment. The interesting points include the increase in car miles per day from 21.9 in 1920 to 28.4 in 1925 and the increase in gross ton miles per train-hour of 24.8 per cent.

TABLE II—COMPARISON OF SELECTED FREIGHT OPERATING STATISTICS

Item	1925	1920	Per cent of change Inc.	Dec.
Mileage operated	1,352	1,436	....	5.8
Gross ton-miles (Thousands)	12,401,068	12,564,536	....	1.3
Net ton-miles (Thousands)	5,567,215	6,483,739	....	14.1
Freight train-miles (Thousands)	6,892	7,301	....	5.6
Freight locomotive-miles (Thousands)	8,546	8,967	....	4.6
Freight car-miles (Thousands)	322,301	295,643	9.1	....
Freight train-hours	520,178	657,244	....	20.6
Tons of coal consumed by freight locos.	1,070,852	1,333,243	....	19.6
Car Miles per day	28.4	21.9	29.7	....
Net tons per loaded car	26.2	31.8	....	18.6
Per cent loaded to total car-miles	65.9	68.9	....	3.0
Net ton miles per car-day	490	480	2.1	....
Freight cars per train	47.8	41.5	15.1	....
Gross tons per train	1,799	1,721	4.6	....
Net tons per train	808	888	....	9.8
Train speed, miles per train-hour	13.2	11.1	18.9	....
Gross ton miles per train-hour	23,840	19,117	24.8	....
Net ton miles per train-hour	10,703	9,865	8.5	....
Lb. coal per 1,000 gross ton miles	152	....	....	....
Loco. miles per loco. day	45.8	43.1	6.3	....
Per cent freight locos. unserviceable	15.1	31.4	....	16.3
Per cent freight cars unserviceable	7.1	7.7	....	0.6



Membership in This Club at Pennsylvania State College Is Restricted to Students of Railway Mechanical Engineering

Report on Derailment at Altoona

THE Interstate Commerce Commission on February 26 issued a report, dated December 28, and signed by W. P. Borland, director of the bureau of safety, on the derailment on the Pennsylvania Railroad at Altoona, Pa., on November 29, at 7:46 a. m., when a runaway freight train, eastbound, moving at about 60 miles an hour, was thrown off the track at a cross-over (at BO block station) and the engineman and fireman were killed. One other trainman was injured.

This train was VL-4, 58 cars and a caboose, which had been run through from Columbus, Ohio, about 300 miles, with two changes of locomotives; one at Dennison, Ohio, and one at Sharpsburg, Pa. On the descending grade of about 1.70 per cent, near GY block station, three miles west of Altoona, the brakes went on automatically and the train was stopped. After a delay of about 30 minutes, it proceeded, and very soon got beyond control. The locomotive and 39 cars were demolished.

The cause of the automatic stopping was not discovered, and the report consists mainly of the statements of the conductor and the head brakeman. The conductor began turning up retaining valves before passing over the summit at Gallitzin, eight miles west of GY, and by his order the hand brakes were set on about six cars at the front end of the train. After running a few miles the conductor noticed that brakes were sticking on about six cars. After the train had been stalled he turned down some of the retaining valves and then turned them up again. A brakeman also tried some retaining valves, but neither man discovered the cause of the trouble. The engineman took the slack of the train three or four times and finally succeeded in starting, although some brakes were still sticking.

While the train was stopped, near GY, the conductor and head brakeman spent some time in argument about conditions and causes, and the brakeman and the engineman also argued, but evidently they came to no useful conclusion, and the train proceeded down the grade without the cause of the trouble in the brakes having been discovered. In less than three miles it was wrecked, at BO crossover.

The operator at BO turned the train from the main track, No. 1, to Track A, in accordance with his plans made before he knew of any trouble.

A pushing engine had been detached at Gallitzin and the runner of this engine, when his engine was cut off, sounded one blast of the whistle, as a stop signal; but the men on the train did not hear this, or at least paid no attention to it.

Inspection of the wreck showed a number of brake pistons with excessive travel, some as much as 9½ in. and 10½ in.

The report concludes as follows:

Conclusions

This accident was caused by failure to know that the air-brake system was in proper condition to control the train before allowing it to proceed from the point at which it had stalled on a heavy descending grade, for which Conductor Perry and Engineman Scheline are primarily responsible.

The investigation developed that after the train had stalled, at a point where the grade was about 1.70 per cent descending, the only thing done by the members of the crew was to endeavor to release the brakes so as to allow the train to proceed, no attempt being made to ascertain the nature of the trouble responsible for the stalling of the train. The engineman had to take the slack several times before he finally succeeded in starting the train, at which time many of the brakes still were sticking, and it appears that after the train had once been started it never again was under the engineman's control. The reason for the stalling of the train was not definitely ascertained. However, all the evidence indicates that the emergency application which stalled the train was due either to undesired quick action of a triple valve at some point in the train or to an open brake pipe probably caused by a burst hose. The theory of an overcharged brake pipe, advanced by Brakeman Pincuspy and Conductor Perry, is not tenable.

Conductor Perry turned down a few retaining valves and bled a few auxiliaries at the rear of the train, and then went directly to the telephone, from which point he proceeded toward the head end of the train and met the brakeman at a point about 25 car lengths from the engine. While Conductor Perry was talking with the brakeman at this point, the engineman was taking slack on the train in an effort to start it, the brakes still sticking, and finally got it moving while the conductor and brakeman were still engaged in conversation. No member of the train crew had an opportunity to know anything about the condition of the train behind the 25th car from the head end. After the train once started it was absolutely beyond control. When Flagman Strayer mounted the caboose after being called in he did not notice the brake-pipe pressure indication on the air gage, but when the speed of the train increased unduly he broke the air hose between the caboose and rear car and found no air in the brake pipe.

This accident very forcibly calls attention, not only to a woeful lack of rule observance on the part of the responsible members of this train crew, but also to lack of adequate safeguards by the Pennsylvania Railroad Company to insure that trains shall be safely operated on this descending grade.

In the first place, the train broke over the summit of the grade with the rear end not charged to the pressure required by rule. The nonchalance with which this fact was treated when attention was called to it by the designated signal from the engineman of the helper engine indicates that the rule is more honored in its breach than in its observance. Next, this train was moved from Columbus, Ohio, to the point of accident, a distance of approximately 300 miles, passing through two established terminals at which the engines and crews were changed, without any test of the brakes other than the ordinary road test to determine that the brake pipe was open throughout the train. No information as to the efficiency of the brakes on this train was had by the crew which took charge of it at Dennison or at Sharpsburg. It was particularly essential that full information about brake conditions should have been furnished the crew which took the train at Sharpsburg, the last terminal passed before descending the grade on which the accident occurred. The evidence is that it is the regular practice of the road to operate trains of this character as this train was operated. This is a bad practice which should be corrected.

The test which was made of the brakes on the cars which remained intact after the accident disclosed brakes with unduly long piston travel, and at least two that were wholly inoperative. It is reasonable to assume that this was typical of the brake conditions on the entire train, a state of affairs which would not have existed had a proper brake test been made at Sharpsburg and the necessary repairs made.

It is a regrettable circumstance that serious accidents such as the one herein considered often seems to be the only means of effecting a correction of unsafe practices of long standing. While the operation of trains on Gallitzin grade is nominally by means of air brakes, it has long been the practice not only to permit but to encourage the use of hand brakes in connection therewith, the number of hand brakes used being left to the judgment

of enginemen and conductors in charge of trains. The control of trains on this grade, therefore, is partly by air brakes and partly by hand brakes. This practice, like all practices which involve a division of responsibility, leads to a reliance upon one method to correct deficiencies in the other, leading to the result that, sooner or later, both methods will inevitably fail when most urgently needed.

The lesson to be learned in this connection is that if trains are to be controlled by means of air brakes they must be so controlled absolutely and without reservation. This means that the air brakes must be maintained in an efficiently operative condition at all times, and employees must be properly instructed in their use. The converse is true of the hand-brake method. Both methods can not safely be used together; and in this connection it may be proper to observe that the use of hand brakes to control the speed of trains is unlawful.

The employees involved were experienced men. At the time of the accident they had been on duty about 14 hours after about 10 hours off duty, with the exception of Head Brakeman Pincuspy, who had been off duty about 24 hours.

Railroad Legislation

WASHINGTON, D. C.

PRESIDENT COOLIDGE hopes that "some kind of a railroad consolidation bill" will be passed at this session of Congress, it was officially stated at the White House on March 12, although he is acting on a general policy of leaving responsibility for legislation largely in the hands of the Congressional leaders.

The day before the President had conferred with Senator Watson of Indiana, chairman of the Senate committee on interstate commerce, regarding the status of the railway legislative program before that committee. Senator Watson reported that the railway labor bill, which has passed the House and been reported to the Senate in identical form, is sure to be passed by the Senate soon. Alfred P. Thom, general counsel of the Association of Railway Executives, had conferred with the President earlier to urge the importance of definite action on the bill soon because of the situation arising with respect to the wage increase demands of the conductors and trainmen.

Senator Watson also told the President that the Cummins consolidation bill, with some amendments, including possibly provision for a seven-year period for voluntary consolidations, would probably be passed by the Senate after a fight but he indicated considerable doubt as to whether it would pass the House at this session.

Senator Willis of Ohio, member of the Senate steering committee, and Representative Tilson, the Republican floor leader in the House, were also at the White House on March 12 and agreed that any consolidation legislation at this session is unlikely.

The Senate committee on interstate commerce held a meeting on March 13 with the idea of having an executive session on some revisions Senator Cummins has made in his railroad consolidation bill, but Senator Brookhart appeared and asked an opportunity to make a statement in which he urged the consolidation of the railroads of the United States into one great system, the government to condemn the existing securities and issue bonds underwritten by the government at a low rate of interest. He said that it ought to be possible to acquire the roads thus at 15 or 16 billions and that perhaps a million dollars of capital stock could then be issued to the most expert railroad managers, who might be selected, he said, by Secretary Hoover, and who would operate the roads for the government. This would avoid the waste of competition, he said, make possible a great saving in capital charges, stop the capitalization of unearned increment and save $200,000,000 a year in the purchase of supplies. When he quoted a statement by C. W. Barron of the Wall Street Journal made some years ago to the effect that the market price of all the railroad securities at that time was about $12,000,000,000, Senator Cummins said that the market quotations at any given time are no index of the actual value of the railroads. Senator Sackett suggested that if the government wanted to condemn the railroad securities cheaply under such a plan it should first pass a law limiting the railway return to 3 per cent so as to depress the market price.

The committee then went into executive session but had hardly begun the discussion of the Cummins bill when time for adjournment came and further consideration was postponed.

On March 16 debate on the bill was resumed with a speech by Senator Pittman of Nevada in favor of the bill and speeches by Senators Phipps of Colorado, and Bruce of Maryland against it, after which an agreement was reached for a final vote on the bill on Wednesday, March 24. A large number of petitions and letters opposing the bill have been read before the Senate by various Senators.

Commissioner Esch of the Interstate Commerce Commission testified before the House committee on interstate and foreign commerce on March 12 on several bills introduced by Representative Newton to amend the interstate commerce act in accordance with recommendations made by the commission in its annual reports or as recommended in some instances by shippers. He recommended an extension of the time for which the commission may suspend a new rate tariff, saying the commission often is not able to complete its investigation in the time now allowed, 120 days, with provision for resuspension for an additional 30 days, and that it often becomes necessary for the carriers to suspend rates voluntarily for further periods. He suggested that the period be made seven months, with no provision for resuspension, or five months for a suspension and two additional months for resuspension, but said that the commission thought a period of ten months, as proposed, and as formerly in effect, would be too long. He said the commission can always vacate a suspension on short notice. A seven months period, he said, would save the commission and the carriers much time and expense in avoiding the necessity for posting and examining supplements giving notice of resuspensions.

Mr. Esch also recommended that section 204 of the act, relating to claims of short lines for reimbursement for the federal control period, be amended to place a time limit for the filing of such claims. He said that last year, six years after federal control, 32 claims were filed under this section and he suggested that August 1 be made the limit, saying that the government is anxious to complete the settlement of matters arising from federal control and that the commission now has to deal only with claims under section 204 and section 209. Regarding a bill to allow an extension of time for the payment of freight charges he said the commission now has the power to liberalize the 96-hour rule which it established in Ex Parte 73 by re-opening that proceeding upon a proper showing. He also recommended provision for the payment of interest on reparation awards against the Railroad Administration and discussed some changes in the provisions relating to the filing of tariffs.

Debate on the Gooding long-and-short-haul bill, S. 575, which was made the unfinished business of the Senate on

March 8, has been proceeding in a very desultory fashion and predictions have been made that its chances of passage were very much lessened by the announcement on Saturday of the Interstate Commerce Commission's decision dated March 1 denying the application of the transcontinental railroads for fourth section relief to meet Panama canal competition. Senator Fess of Ohio, who has opposed the bill, had the full text of the decision published in the Congressional Record for March 15, apparently for the purpose of controverting the impression sought to be given by the proponents of the bill that the commission almost invariably decides such cases in favor of the railroads and the "Wall Street interests." Senator Gooding on the same day tried to get a unanimous consent agreement for a final vote on the bill on March 23 but Senator Bruce of Maryland objected. Senator Gooding said that a number of Senators would be away over March 17, making speeches at St. Patrick's Day gatherings and could not bring the bill to a vote this week.

Senator Gooding began a long speech on the bill on March 12, during which there was some debate on the bill and Senator Fess made a long speech against it on March 13. Speaking on the day before the commission's decision was made public, Senator Gooding referred to the application of the transcontinental railroads and said: "We believe there is a grave danger in the granting of these violations that the transcontinental railroads are asking. Commissioner Esch of the Interstate Commerce Commission, who testified before the Interstate Commerce Committee on Senate bill 575, in his statement showed that 7 out of the 11 commissioners of the Interstate Commerce Commission were in favor of violations of the fourth section of the interstate commerce act, and that is not strange at all when we know what the mighty influence of the railroads will do in the affairs of this government." "So, Mr. President," he added, "the only way the interior can be saved from a discrimination in freight rates that will bring wreck and ruin to the interior is to pass Senate bill 575." He was referring to Mr. Esch's testimony, supported by seven commissioners, opposing the passage of the Gooding bill to take away all discretion on the part of the commission to allow departures from a strict fourth section rule. Two others filed separate statements declining to approve the bill. The seven who opposed the bill, however, were not exactly the same as the seven who voted against the transcontinental applications. Commissioners Esch, Meyer and Aitchison dissented from the decision of the commission, although they were among those who opposed the bill, and Commissioners Woodlock and Eastman, although they voted for the decision, did not approve of the bill. Only Commissioners Campbell and McManamy supported the bill.

Senator Gooding referred to the power of the commission to allow fourth section departures as "a dangerous power to place in the hands of any body of men," and said that "Ever since the creation of the Interstate Commerce Commission many of our best citizens have believed that railroad influence has dominated in a large measure the appointment of members of the commission, and sometimes I am afraid there is much in that contention."

Senator Wheeler of Montana took a similar position. Speaking almost at the time the decision was being issued, he asked if the question should be left "to a commission which already has its mind made up in advance with reference to these matters" and he referred to Commissioner Woodlock, who voted to deny the applications, as one "going upon that commission, according to his own statement, with pre-conceived ideas with reference to this long-and-short-haul problem, because he is opposed and in favor of giving fourth-section violations."

Senator Gooding told the Senate that if the bill should become a law it would "not change a single freight rate anywhere," for it "specifically provides that any violations of section 4 that were in existence prior to the 7th of December, 1925, shall not be required to be changed except on the authorization of the Interstate Commerce Commission." The bill, he said, "is in no way a rate-making bill. It merely defines the policy that the Interstate Commerce Commission shall follow in the future in dealing with freight rates to meet water competition. All this bill seeks to do is to prevent further destruction of water transportation in America by the railroads forcing the people of the interior to pay more for the shorter haul to make up the losses sustained by the railroads for the longer haul to destroy water competition." In reply to a suggestion by Senator Bruce he said: "I want to say to the Senator from Maryland that the Interstate Commerce Commission pay very little attention to laws as passed by Congress." He said there had been a lobby working against the bill such as he had never seen before on any occasion, consisting of "presidents of railroads, vice-presidents of railroads, traffic managers representing great cities," stalking the halls of Congress and importuning Senators to vote against the measure. He referred to Alfred P. Thom, general counsel of the Association of Railway Executives, as having a "record of 100 per cent efficiency in stopping railroad legislation regardless of how meritorious it may be."

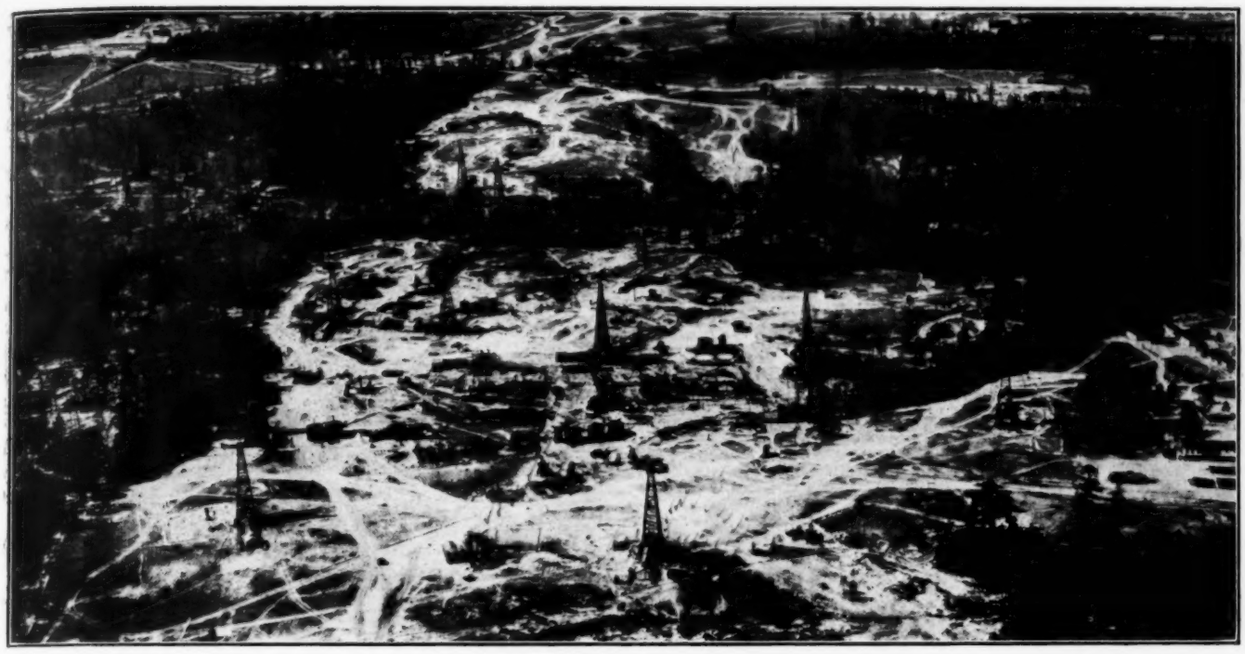
Senator Gooding was allowed to make his speech for the bill without much interruption but Senator Fess, who based his argument largely on the idea of leaving details of rate-making to an expert commission, was continually heckled by Senators Pittman, Wheeler and Gooding. There was much discussion of the meaning of the requirement of the statute, as amended in 1920, that the rate made to meet water competition must be "reasonably compensatory," which the commission has interpreted to mean that the rate must more than cover "the extra or additional expenses incurred in handling the traffic to which it applies." Senator Pittman said the commission requires the railroads to state specifically that the rate they ask for is "unreasonable." Senator Cummins remarked that he was the author of the language of the 1920 amendment and that he did not mean what the commission has subsequently determined the law to mean.

"Does the Senator mean that 'reasonably compensatory' should be construed to mean fully compensatory?" asked Senator Fess.

"Yes, I do," replied Senator Cummins. "I mean that a reasonable compensatory rate is a rate that will contribute to the income of the carrier its share of the burden which the carrier must bear." He said he was in favor of the bill but not for all the reasons given by Senator Gooding. Senator Lenroot remarked that if the law requires the rate on the long haul to be reasonable and then permits a higher rate to the intermediate point it would be authorizing an unreasonably high rate at the intermediate point, beyond the power of Congress to authorize.

Commissioner Esch appeared before the committee again on March 16 and 17, discussing various bills introduced by Representative Newton, and also recommendations made by the commission in its annual report. One of these asked legislation to provide for transportation of the commission's engineers on locomotives without being required to sign a release from liability. Another recommended a discontinuance of the requirement that the commission publish schedules of ship sailings.

Representative Browning of Tennessee has introduced a bill, H. R. 10,388, to give the Interstate Commerce Commission jurisdiction over interstate transportation of passengers and property by water.



An Air View of a Part of the Smackover, Ark., Oil Field. Copyright by Major Hamilton Maxwell from Underwood & Underwood

Sharp Competition Aroused by Oil Traffic

Smackover field the scene of traffic fight marked by unusual strategy and operating feats

ONE of the keenest and most interesting contests for traffic that has been staged for many years is now in progress in the central south. The stake is the oil traffic from the Smackover field in Arkansas which moves in quantities up to a thousand cars a day from southern Arkansas to the Gulf coast. The railroads involved are the Missouri Pacific, the Chicago, Rock Island & Pacific, the Illinois Central, and others. The battle has been in progress for months and is still going on.

Competition for oil traffic is always brisk. This is due to its nature, for it can be handled profitably only when moved in volume, and the uncertainty as to the length of time that the traffic will last renders quick returns imperative in order to justify heavy outlays for improved facilities.

In the Smackover field itself, the Missouri Pacific has the advantage because the field has developed closely adjacent to its line for a distance of 25 miles. The Rock Island, which had the initial advantage since the part of the field first developed adjoined its property, has since seen the field move slowly away. It would, in fact, be left high and dry today if it were not for a number of pipe lines which have been laid to carry the oil for several miles from the main field to the Rock Island line. In securing the installation of these pipe lines, the Rock Island has won its battle to prevent being shut out entirely from participation in the handling of the traffic.

The more interesting strategy of the struggle has occurred nearer the southern end of the oil haul. Here we find the Rock Island delivering a considerable portion of the oil originating on its line to the Vicksburg, Shreveport & Pacific at Ruston, which road transfers it to the Illinois Central at Vicksburg, and to the Southern Pacific and other roads at Alexandria, La., while a smaller portion is routed all the way to the southern terminus of the Rock Island at Eunice. The Rock Island's fight is for the longer haul on a larger portion of the oil that it originates all the way to Eunice.

On the other hand, the Missouri Pacific, which has its own or subsidiary lines to all the points of destination of the oil from the Smackover field, must turn over about two-thirds of its traffic to the Illinois Central at Natchez, on which it receives only the relatively short haul to Natchez. The remainder of the oil traffic originating on its lines is routed over the Gulf Coast Lines, some to Baton Rouge, some to New Orleans, some to Lake Charles, some to Houston, and some to Galveston. Small quantities are also carried via the Vicksburg, Shreveport & Pacific from Monroe to Vicksburg, where connection is made with the Illinois Central. The goal of the Missouri Pacific is naturally to secure the long haul to destination for as much as possible of the oil originating on its line.

There are definite reasons why the Illinois Central participates so largely in the handling of the Smackover oil traffic. In general, however, it may be said that the oil companies route their consignments over lines which

will provide the quickest, most regular haul from starting point to destination. This forces every road which handles any of the oil to maintain its operating efficiency at an extraordinary height in order to be able to show that the quickest route to destination is via its own lines. Eliminating other considerations, the roads which get the oil business are those which provide the best service. The battle for the traffic has therefore, in general, taken the form of a strenuous campaign for quicker and more reliable service and a service capable of handling a suddenly increased volume of traffic without congestion.

Strategy, however, has also entered into the situation to make it more interesting. The story is told that one of the originating railroads, which has been forced to surrender a large portion of its oil at a point far short of the long haul destination which it could provide, adopted tactics which are reminiscent more of the earlier days in railroading than the modern, less exciting ones. This road, so the story goes, began to deliver oil to its competitor in quantity at one of two available points of delivery. Then, after it had seemed to establish that point as the regular one for such delivery and had led the competing line to concentrate its motive power and other equipment at that point, it suddenly without warning began delivery in huge volume to the second junction with the competitor. The apparent motive was to bring about a blockade at the second junction point so that the delivering line could bring to the attention of the producing companies that the competitor was unable to handle the traffic and that it, the originating line, could better carry it through to destination. The competitor met the situation successfully but only by the most strenuous efforts.

This story typifies the existing spirit of intense effort to secure the haul of every possible barrel of oil. It is a spirit which has led the railroads in the field to spend large sums of money to provide facilities for the speedy handling of the oil. It is the spirit which has enabled the operating departments of the roads to make records for efficiency with the most meager facilities. If it were not for this spirit the immense traffic in oil, oil well equipment and building materials could never have been handled without completely paralyzing the transportation lines in the region.

Interesting as are the competitive aspects of oil traffic, they are even less dramatic than the story of the effect of the discovery of oil on a territory and what such a discovery means not only to the territory but to the railroads serving that territory. The story of the Smackover field is typical of the others. It proves that the railroads are as daring and as capable of meeting emergencies today as they ever have been.

El Dorado, Ark., Field the Largest Today

The oil field in the vicinity of El Dorado, Ark., known as the Smackover field, has one of the largest productions in the United States today. Its present daily production is well in excess of 200,000 bbl. During the four and one-half years of its existence, the total production of the Smackover field has been approximately 126,000,000 bbl. It is reached by two railroads, the Missouri Pacific, whose Louisiana division from Gurdon, Ark., to Monroe, La., traverses the whole length of the field, and the Chicago, Rock Island & Pacific, whose Arkansas-Louisiana division intersects the southern portion of it. The embarrassing habit of oil fields of appearing in places previously requiring and receiving only the most meager railroad facilities, was exemplified in the Smackover field. Before the discovery of oil, the railroads in the vicinity of El Dorado were branch lines, poorly equipped and yet entirely able to handle the small traffic offered.

Oil was first discovered in Arkansas on January 10, 1921, when the "Busey well," was drilled in several miles south of El Dorado and adjacent to the line of the Rock Island. Throughout 1921 drilling continued in what is known as the South field, adjacent to the Rock Island, and a total production of over 10,000,000 bbl. was obtained during the year. In 1922 drilling began to move northwest into what is known as the East field, the production in the South field having passed its peak. Still later in 1922, drilling reached Norphlet, which was the heaviest producing field during that year. The total production in 1922 was 12,712,000 bbl.

The Revenues from the El Dorado Station of the Missouri Pacific Increased from $16,750 in 1920 to Nearly Two Million Dollars in 1925

The Smackover pool, the second greatest producer of oil in the United States, was tapped late in 1922, and extensively exploited in 1923. It is still the center of production, although drilling and highly productive wells now extend considerably farther northwest of Smackover. The total production in 1923 was 36,610,000 bbl., increasing to 44,545,511 bbl. in 1924. In the spring of last year a deep sand was reached which resulted in the surpassing of all previous production records for the field. Since this discovery the average production has exceeded 200,000 bbl. a day. The peak of production was reached on May 25, when over 480,000 bbl. were produced. The present production is somewhat in excess of 210,000 bbl. daily.

The discovery of oil in the vicinity of El Dorado has naturally brought about a "boom" in that town. From

a population of approximately 3,000 in 1920, it has grown to a city of some 30,000 population. It now has 18 miles of paved streets, compared to 1½ miles in 1920. It has built a number of fine churches, hotels, and homes and is now planning a ten-story office building. The importation of building materials has naturally given the railroads a huge volume of traffic.

Characteristics of Oil Traffic

There are some 35 producing companies in the Smackover field with a total of 5,000 producing wells. Most of the production of these wells is shipped to the Gulf ports in Louisiana and Texas where some of it is refined

Tank Cars Are Loaded from Pipes Carried by Wooden Racks

and then loaded on boats for eastern ports as well as for export, and some loaded on boats in the crude form. In addition, during the summer months, from 2,000 to 3,000 cars of road oil are shipped north for use on the highways in the northern states. There is also a movement of some proportions of fuel oil and gasoline to Chicago. At least 80 per cent, however, goes south to Louisiana and Texas.

Very little of the oil is refined at Smackover. Smackover oil is a very heavy oil with a small gasoline content and only the large "cracking plant" refineries are capable of refining the crude oil.

Troublesome Features of Oil Traffic

The most troublesome characteristic of oil traffic is its fluctuating nature. It is the custom of producers in general to hold oil in storage at the field until a favorable price level is reached, and then to dump it onto the railroads in huge quantities, demanding quick shipment. Thus carloadings may be very small, perhaps only 50 or 100 cars, on one day and leap to 500 or 600 cars over night. No notice is given to the railroads of what the demand on any future day will be. The traffic departments of the oil companies telephone their car requirements for the following day to the railroads each evening. This is all the notice that is given as to the amount of traffic that the railroad may expect. This custom requires that facilities be available at all times to handle the peak loads of the traffic, and leaves these facilities idle when traffic is at a low ebb. The oil companies are reluctant to do business in this way, but it is one of the apparently necessary evils of their industry. That such violent fluctuations do not completely paralyze the railroads is a tribute to the ingenuity and ability of the operating officers immediately charged with the handling of the traffic.

The railroads have a strong competitor in the pipe lines. These pipe lines, range in size up to 10 in. and 12 in. in diameter. Three pipe lines extend to Shreveport, La., where connection is made with another pipe line to Baton Rouge, La.; two pipe lines go to Port Arthur, Tex.; one to Camden, Ark., and one from Smackover east to the Mississippi river where the oil is loaded into barges for shipment on the Mississippi river to the refineries in southern Louisiana. These pipe lines have a total capacity of approximately 100,000 bbl. per day, a 10-in. pipe line, for example, having a capacity of approximately 10,000 bbl. daily. Since the average production of the Smackover field is not very much in excess or 200,000 bbl. daily, it can readily be seen that the railroads are very liable to receive only the surplus which the pipe lines cannot handle during the period of heavy shipment, since the pipe lines are owned by subsidiaries of the large producing companies themselves. The effect of this producer-owned pipe line competition is that the producing companies use the pipe lines for their normal shipments, giving the railroads only what the pipe lines cannot take care of. Furthermore, when the market for crude oil is low the tendency, as stated, is to store it at Smackover, so that during these periods the traffic on the railroads is reduced to a minimum. It is estimated that there are now approximately 25,000,000 bbl. of crude oil in storage at Smackover.

Pipe line competition has been rendered less disastrous to the railroads by reason of the fact that there is an exceptionally large number of small independent producers in the Smackover field. These producers, who are not themselves financially interested in the pipe line companies, give the bulk of their oil shipments to the railroads. One of the pipe line companies, however, is an independent organization and bids for the business of the independent producers on a contract basis. The effect of this is to keep the rate charged by the railroads for the movement of the oil to the minimum.

The handling of the oil from the wells into the cars is simple. The oil is piped direct from the wells or from the storage tanks to loading racks which are located parallel to the railroad sidings. These racks are rough scaffolds which support the pipe lines at the height of the car intakes. The flow of oil is controlled by valves. There are both single and double track racks, the largest having a capacity of approximately 50 cars. A rack with its full capacity of cars spotted can load them in approximately three hours. Thus the problem of the railroads is to provide the empty cars as demanded and then to move them to their destination.

The tank cars are not owned by the railroads, but are rented from the tank car companies at a rate of 1½ cents per mile, loaded or empty. These tank cars have a capacity usually of about 200 bbls. The tank cars cost the owners approximately $35 or $40 a month, so that they demand the utmost in service from the railroads. That exceptionally fast movement of the tank cars is provided, is evidenced by the fact that the tank car owners often make money on their tank cars on account of their income from the railroads for the high mileage which the cars cover in a month.

The Rate Controversy

Interest in the Smackover field has recently been stimulated by a controversy over a proposed increase in the rate for the transportation of crude oil from Smackover to Baton Rouge, New Orleans and Texas ports. The railroads proposed a rate of 16 cents a cwt., to go into effect on August 16, but this was suspended by the Interstate Commerce Commission, which later held that the rate had not been justified by the railroads, but gave them permission to reopen the case by publishing the 16 cent rate again. There was a 16-cent rate in effect until about a year ago, when the production of crude oil in the Smackover district was very heavy, resulting in an accumulation of fifteen to twenty million barrels in storage. To enable the refineries at the Gulf to handle this oil in competition with the shipments of Mexican crude

oil, the railroads inaugurated a rate of 14 cents, which stimulated shipments considerably. This 14-cent rate offers so narrow a margin of profit, particularly at a time when shipments fluctuate violently and are not at all assured, that the railroads proposed a resumption of the 16-cent rate. The suspension of the tariff was secured through the efforts of the producing companies in the field.

The most strenuous objection to the increased rate was made by the independent producers, who claimed that they would be prejudiced in competition with the larger producers who operate their own pipe lines to their refineries and would thus be less affected by the increase in rate. It is notable, in this connection, however, that an increase of two cents per cwt. would equal only six cents per barrel. This is not a large increase when it is considered that the fluctuations in prices for crude oil has been very much more than this within a space of only 30 days. For example, the price of crude oil on January 1, 1925, was 95 cents per barrel; on February 1, $1.15 per barrel; on March 1, $1.30 per barrel; on April 1, $1 per barrel; on May 1, 40 cents per barrel; on June 1, 80 cents per barrel; on July 1, 80 cents per barrel, and on August 1, 85 cents per barrel.

Quantity of Traffic

The car loadings of oil out of the Smackover district since the opening of the field in 1921 have shown a steady increase. Car loadings for both the Missouri Pacific and the Rock Island in 1921 were 21,295 cars. In 1922 they increased to 24,297 cars, and in 1923 a total of 59,442 cars were loaded. In 1924 a record of 97,578 carloads was reached, but this is far overshadowed by the record for 1925, for up to September 1 of that year, car loadings for both roads were approximately 144,000 cars. It is not at all unlikely that the car loadings for 1924 were doubled in 1925.

Rock Island Handled First Oil

The Rock Island has been connected with the oil boom in El Dorado in several ways. In the first place, the first indication that there was oil in the territory was the discovery of a gas well on the property of one of its employees. Second, and more important, the first oil wells in the El Dorado field was drilled in immediately adjacent to the Rock Island line. Prior to the discovery of oil the portion of the Louisiana division which passed through El Dorado had been a lumber line with light rail, short sidings, and few facilities of any sort. A change began, however, in March, 1921, when the first shipment of 52 cars of oil went out over the Rock Island. Then emergency measures had to be effected at once. To accommodate the inrush of passengers the Rock Island operated 12 daily passenger trains into El Dorado in January, 1921. To carry the oil field workers from El Dorado to the field, which was several miles distant, a shuttle service was put into effect, making four round trips daily. These trains carried between two and three thousand passengers daily, for a period of six months.

New facilities of all kinds had to be constructed at once. Fortunately, a new roundhouse, power plant and mill building had been constructed the year before, following the destruction of an older building by fire. The roundhouse and shop buildings were greatly enlarged in 1921, and a 500-car capacity tank car yard was also constructed. Loading rack tracks with an aggregate length of 7,000 ft., were constructed at close intervals along the line through the oil field.

Besides the necessary strengthening of the track by heavier rail, reballasting, etc., the Rock Island constructed long passing tracks at frequent intervals on the line between El Dorado and Eunice, La. Even with these extensions the facilities were found to be insufficient this year so that since July 1, 25,000 ft. of additional passing tracks have been constructed and many more yard tracks have been put in.

Although the main field has moved away from the Rock Island lines since 1922, the Rock Island, as stated, participates in the handling of the Smackover oil by means of 10 pipe lines through which oil from the field northwest of the Rock Island is carried to the Rock Island. If it were not for these pipe lines the Rock Island would have practically no oil traffic since the production adjacent to its lines has virtually disappeared. The demand for sufficient transportation to handle the peak of the traffic, however, has necessitated the construction of these pipe lines to the Rock Island so that its oil traffic has increased steadily in spite of the movement of the field away from its line.

With the beginning of the oil movement, the old equipment and personnel were, of course, far from adequate. To meet the demand for power, the number of locomotives assigned to the district was increased from 15 to 90 and this number has been increased to 125 since July, 1925. The transportation forces likewise had to be augmented. Prior to the opening of the oil fields 100 train and engine men had been sufficient to handle all traffic on the division. When the oil movement began, however, more than 450 train and engine men were hired and kept steadily in service. The increased traffic in July, 1925, resulted in the hiring of many more employees, including 220 brakemen, 50 switchmen, 75 enginemen, and 120 firemen. From 50 to 60 brakemen are carried on the extra list at all times now. The number of dispatchers necessary to handle the dispatching of the trains was tripled after the oil movement began. These increases were made necessary not only by the oil movement and the heavy passenger movement, but by the 125 carloads of supplies, lumber, rig timber, pipe, etc., which were brought into El Dorado daily during the first six months of the boom. This traffic still continues in volume. The payroll of the Rock Island at El Dorado is now in excess of one million dollars a year.

The Rock Island now operates 12 through freight trains daily in each direction on the line south of El Dorado. These trains consist of 40 cars each and are double headed on account of the fairly light power used and the heavy grades. The Rock Island uses oil-burning Consolidation type locomotives exclusively on this part of the line. The oil trains are run southbound as sections of the passenger trains in order to insure their superiority. Northbound, the trains of empties are run as extras in order to give the loaded trains the right-of-way at all times. The schedule of trains southbound from El Dorado calls for arrival at Ruston, 55 miles, in 6 hours, at Alexandria, 146 miles, in 12 hours, and Eunice, 201 miles, in 18 hours. The average speed of the trains is thus approximately 11 miles an hour.

In return for the money it has spent providing facilities at El Dorado, the Rock Island, of course, has received a return in largely increased earnings. The earnings from freight inbound and outbound at El Dorado have increased from $20,000 a month before the discovery of oil, to $650,000 a month at present. Ticket sales have increased from $3,000 a month to $40,000 a month.

Missouri Pacific Spends Millions

Even more extensive changes were necessary in the rehabilitation of the line of the Missouri Pacific when the oil traffic began to come in great volume. In the words of an officer of the Missouri Pacific, "The Gurdon district of the Louisiana division was the branchiest branch

line on the whole Missouri Pacific." The line did very little business and as a result its physical condition was only what one would expect. El Dorado was merely a point on the line, with only four short side tracks and no terminal facilities whatever. The line itself was laid with 55-lb. rail and was in no condition to handle heavy trains or power.

To provide adequate facilities for handling its oil traffic, the Missouri Pacific has spent and is spending nearly three million dollars in improvements to the line and in establishing a terminal at El Dorado. Four additional passing tracks have been constructed between El Dorado and Collinston, one between Monroe and Alexandria, and four on the Lake Charles district. Three long passing tracks were constructed in the Alexandria yard and a 4,000-ft. passing track is being constructed now at Collinston. Forty-eight thousand dollars is being spent in strengthening and straightening bridges on the line between Gurdon and El Dorado. In addition, four 50-car tracks at El Dorado, two 70-car tracks at South El Dorado, a 70-car track three miles north of El Dorado, a 50-car track two miles north of El Dorado, an 80-car track near Orears, a 50-car track near Norphlet, two 50-car tracks at Griffin, and a 70-car track at Louann are under construction or have been authorized.

The Missouri Pacific had practically no buildings at El Dorado aside from an old passenger and freight depot. Since the oil traffic began a new passenger station has been constructed, the old depot has been converted into a yard office and a coaling station has been installed. There is still no roundhouse, but one has been authorized, to be equipped with a large turntable and a number of auxiliary and repair tracks.

The line itself has been rehabilitated by the replacement of the old rail with 85-lb. rail and of the old ties with new timber. The number of passing tracks that have been installed has virtually made the entire line from El Dorado south to Natchez a double track line.

The Missouri Pacific forces at El Dorado have been greatly increased. It now employs approximately 225 train and enginemen with 75 more on the extra board who are employed virtually steadily. The mechanical department employs 75 men, there are 40 in the station, freight and yard offices, and 40 more employed as switchmen. In the oil fields 125 more men are employed in switching service.

The Missouri Pacific has 45 heavy locomotives, 8 smaller locomotives and 12 switch engines operating out of El Dorado. It turns approximately 40 locomotives a day at that point. Those used north of El Dorado through the oil fields are of the oil-burning, Mikado type, while those on the lines south of El Dorado are of the coal-burning, Consolidation type.

Operates Full Tonnage Trains

The Missouri Pacific is now carrying on a successful test of operating trains of 40 cars from El Dorado south. Heretofore trains of 35 cars have been the rule, but the operating department is pushing the engine rating to the limit on every train that is sent out. Two regular and five or six extra oil trains are operated from El Dorado southbound daily, the trains being assembled at two points north of El Dorado. Northbound trains are assembled at Griffin and southbound trains at Kenova, the bulk of the movement, of course, being southbound. The loaded oil cars are switched from the 25 loading racks served by the Missouri Pacific and assembled in full trains of 40 cars at Kenova. They are then hauled to El Dorado by the Mikado type locomotives which operate back and forth in a shuttle service. At El Dorado the trains are picked up by the Consolidation locomotives and hauled southward with almost no delay. The southbound trains are operated on a schedule of 6 hours to Monroe, 75 miles, and 10 hours to Natchez, 164 miles.

Although the oil traffic has brought about chaotic conditions along the entire Louisiana division ever since it began, on account of the lack of facilities for handling it, the capacity of the line and of the men operating it has apparently never been reached. The largest day's loading was 650 cars and even that did not bring about a blockade. The growth of the traffic, due to development of the field, has been so steady and so fast, however, that in spite of the efforts that have been made to catch up on it, this has not yet been accomplished. It seems likely, however, that the third million dollars which the Missouri Pacific is now spending in the El Dorado district will enable the road to catch up with its oil traffic.

Illinois Central Affected at Natchez

The oil traffic has brought about a great change at Natchez where a large amount of traffic is delivered to the Illinois Central by the Missouri Pacific. Before the oil movement began, Natchez had been a very quiet point on the Yazoo & Mississippi Valley and was almost without facilities for handling any heavy traffic. A number of improvements have been installed, however, so that the present average traffic of about 300 cars a day is handled efficiently. A new incline has been installed by the Missouri Pacific on the west side of the Mississippi river by means of which the cars of oil are loaded onto a ferry for transportation across the river. This ferry has a capacity of only 17 cars, but by working it three shifts and supplementing it occasionally with a small barge and tug boat, the oil is transported across the river without congestion.

Station Revenues Mount

What an oil boom means to the revenue of a railroad is shown by a comparison of the station revenues of El Dorado and vicinity before the oil boom began and since that time. The gross revenue from freight of the Missouri Pacific station at El Dorado in December, 1920, was $16,750. In October, 1921, nine months after the discovery of oil, the station revenues at El Dorado had jumped to $242,172, October being the best month in that year. The total station revenues in 1923 were $2,402,624, and in 1924, $1,745,989. The record for 1925 may surpass all others, the total station revenues for the first eleven months of the year being $2,163,677.

Even more astounding than the increase in the El Dorado station revenue are the increased earnings of the stations of Norphlet, Smackover, and Louann, three towns which are now in the very center of the main oil field. Prior to the discovery of oil there were no towns at these points, they being, with the possible exception of Smackover, merely blind sidings. Smackover was the largest of the three and had a station, its station revenue per month being approximately $200. With the discovery of oil, however, there has come a great change. Louann, which was not even on the map five years ago, had total revenue from freight inbound and outbound in 1923 of $178,083. In the following year this had increased to $343,487, and in the first eleven months of 1925 the total revenue was $617,199. Norphlet had no station in 1920. But in 1923 its total revenue from freight was $1,134,832. In 1924 it was $2,027,095 and in the first eleven months of 1925 it was $2,860,338. Smackover has become by far the largest station, in point of revenue, in the district. In 1923 its revenue from freight inbound and outbound was $5,040,546. This increased to $5,999,547 in 1924, and so great was the tonnage of oil last year that the revenue for the first eleven months of 1925 was $10,422,823.

Adding the revenues of these three towns it is readily

apparent that the discovery of oil alone has brought to the Missouri Pacific from three places which previously gave it practically no business, $6,353,461 in 1923, $8,370,129 in 1924, and $13,900,350 in the first eleven months of 1925. These figures are astounding, but, for that matter, everything about an oil field is astounding.

How Long Will It Last?

The one question which is in the minds of every one in the oil fields and certainly in the minds of the railway officers who authorize the expenditure of money for new facilities in the oil field is, How long will it last? If the oil movement collapses and the traffic disappears, the money spent at El Dorado and in the vicinity will have been almost completely wasted since there is no indication that any other traffic can be developed to replace the oil traffic, in the event of its loss. If the oil traffic continues, the railroads will break even, or make money. But will it?

No one knows anything about an oil field. Every so-called estimate of the length of time that a field will last is nothing more or less than a guess based largely upon hope. But as expert opinion as there is seems to agree that the present high production will continue at least two or three years, and that the field should continue production in considerable volume for 15 years. It is a fact that drilling is now going on 30 miles east and 30 miles west of El Dorado and 40 miles north and south. If much good production is secured as far away as this, the oil traffic should continue in volume for some time to come. It is believed that the pool at Smackover is the center of the district and that other pools are merely tributaries to the main Smackover pool. If that is true, drilling many miles away from Smackover is unlikely to bring in wells of large production, although producers in paying quantities may well be encountered. It is hardly expected, however, that production in the field as a whole will increase much above the present level, but if present production is maintained for a few years, and oil continues to be produced in paying quantities for a while longer, the railroads will be well satisfied. They will have won their gamble, as well as demonstrated that even the hardest problem is not too much for them to handle.

Transcontinental Rates Denied

Commission refuses fourth section relief to meet canal competition

WASHINGTON, D. C.

ON March 13, while the Senate was debating the Gooding bill, intended to take away from the Interstate Commerce Commission discretion to allow railroads fourth section relief for the purpose of meeting water competition, the commission issued its decision on Fourth Section application No. 12,436, denying the authority asked by the western transcontinental railroads to establish reduced rates on a list of some 40 special commodities from points in eastern defined territories, Groups D to J inclusive, to Pacific coast terminals, lower than are observed at intermediate destinations. The case was submitted to the commission on argument on October 16, 1924, following a proposed report by an examiner, and the report is dated March 1, 1926. The decision was reached by a vote of 7 to 3, Commissioners Meyer and Aitchison joining in a long dissenting opinion by Commissioner Esch stating that the denial of the application under the circumstances "savors of an arbitrary exercise of authority which we do not have under the statute as interpreted by the Supreme Court in the Intermountain Rate Cases." Commissioner Hall did not participate. Commissioners Lewis and Woodlock, although concurring in the report, expressed the opinion that the intercoastal water lines ought to be placed under the same regulation as that to which the transcontinental rail lines are subjected in connection with similar traffic conditions.

The majority report indicates that it was based in part on a belief that the proposed reductions in rail rates would not accomplish the desired result but that if they should be water lines would be unduly hurt.

The principal commodities covered by the application are iron and steel articles, paper and paper articles, ammunition, cotton piece goods, lard substitutes, paint, roofing, rosin, soap and soda. The origin territory extends from Chicago, on the east, to Denver, Colo., on the west. Group D, embracing Chicago territory, is the most important origin group. It was proposed to reduce the rates to the Pacific coast ports in order to place the manufacturers of the Middle West more nearly upon a rate equality with their eastern competitors, who by reason of their location on or near the Atlantic seaboard enjoy the advantage of cheaper water transportation. The applicants hoped that by stimulating traffic through the proposed reductions they might be able to increase their net revenues, but they did not propose to apply the reduced rates to intermediate destinations, since to do so would more than offset the gain from increased traffic to the ports.

Abstracts of the majority report and of the separate opinions follow:

Report of the Commission

The application differs from that of 1921 which was considered and denied in *Transcontinental Cases of* 1922, in that the commodities are not as numerous and the territory of origin is confined to points directly served by the western carriers. The eastern carriers joined in the former application, but do not join in this.

Generally speaking, prior to March 15, 1918, rates to the Pacific coast terminals were lower than to intermediate points. On that date the rates in effect to intermediate territory on the commodities embraced in this application were extended to the terminals, in conformity with the decisions in *Reopening Fourth Section Applications*, and *Transcontinental Rates*, denying fourth-section relief. These rates were increased under the general increases of 1918 and 1920 and were decreased under the reduction of 1922. Thereafter, when the application filed in 1921 was denied, the lower rates then proposed on most of the items here under consideration were published by the western carriers to the terminals from the origin territory covered by the present application and were observed as maxima at intermediate points. On certain of the articles rates slightly higher than the proposed terminal rates were published and blanketed back into the interior. As the result of

these adjustments the maximum rates to intermediate territory, except on dry goods and cotton piece goods, are now lower than they would have been if held to the two general increases and one general reduction.

Transcontinental Rates, supra, was decided in June, 1917, when water competition through the Panama Canal was of minor importance, due to the withdrawal of vessels for use in the trans-Atlantic service. When the application of 1921 was heard service by water through the canal had been resumed. At the time of the hearing in the present case the intercoastal movement was greater than at any previous time in the history of the canal. This has created such a change in conditions that the western carriers feel justified in renewing their application and in proposing rates that are lower than those formerly proposed.

Certain of the items included in the application of 1921 have now been withdrawn, as investigation has indicated a relatively light movement by water. As a rule the rates now proposed on iron and steel articles are from 5 to 10 cents higher than those originally proposed in this proceeding.

While the natural growth of population in the West has been reflected in an increase in the total traffic of the western transcontinental lines, the all-rail movement to the Pacific coast of many important commodities which they handle has declined.

Increase in water-borne tonnage is further indicated both by the increase in the number of vessels engaged in the trade and by the total tonnage carried. At the time of the former report there were 13 steamship lines operating 77 steamships between the Atlantic or Gulf and Pacific coasts. At the present time there are 16 lines operating 146 steamships. In 1921 the total westbound tonnage of intercoastal traffic amounted, according to the Panama Canal record, to 893,396 long tons. The movement in 1923, as reported by the division of statistics, bureau of research, United States Shipping Board, was 2,764,029 long tons, an increase over 1921 of 1,870,633, or 209 per cent.

Rates Proposed on Iron and Steel

The rail carriers recognize that transportation by water is so much cheaper than by rail that they can not hope to divert to their lines much, if any, traffic which may originate at the Atlantic or Gulf ports or close thereto. Most of the production, however, is inland, and they anticipate that by reducing their rates from Chicago and related territory so as more nearly to equal the combination of the rail-and-water rates from the principal eastern originating points, more tonnage will move over their lines, thus increasing their net revenues. The bulk of the westbound movement through the canal consists of iron and steel articles, and the principal points of production are in the Pittsburgh district. Most of the iron and steel articles listed in the application move from Pittsburgh to Baltimore, the nearest port, at a rate of 31 cents. The rate on these articles from Baltimore to the Pacific coast ports by water is 40 cents, producing a combination rate from Pittsburgh of 71 cents. To this sum must be added the incidental charges for water service which are not incurred when the movement is all rail. These incidental charges cover wharfage, handling, and insurance, and aggregate about 5.5 or 6.5 cents additional, varying slightly at the different ports. The rail carriers have, therefore, a total charge of about 76.5 or 77.5 cents to meet to place their rates from Chicago on an equality with the rail-and-water rates available to the manufacturer at Pittsburgh. Iron and steel articles will not move freely by rail at rates which exceed the rail-and-water rates by more than 2 or 3 cents, and consequently on such articles as may move from Pittsburgh at charges of from 76.5 to 77.5 cents the rail lines are proposing a rate of 80 cents from Group D. On some iron and steel articles the port-to-port rates are 45 and 55 cents, and on these articles the all-rail rates proposed are correspondingly higher than the basic 80-cent rate. With respect to those commodities which move at a rate of 40 cents from the ports, the view seems to be that an all-rail rate of 80 cents from Chicago would not attract much, if any, additional traffic. The United States Steel Corporation, with its mills in the Chicago district and in the East, including one at Baltimore, Md., would continue to supply the Pacific coast from the eastern mills. Some increase in traffic might be expected from the independent mills in the Chicago district.

Views of the Parties

The views of the various parties interested in the transcontinental rates are substantially the same now as they were in 1921 when the former application was filed. The Middle West interests, with the exception of the iron and steel industries affiliated with the United States Steel Corporation, generally support the application. Their competition with eastern manufacturers has been growing more and more acute and business which they formerly enjoyed on the Pacific coast now moves largely from the East through the canal.

The interests on the Pacific coast are divided in their views. Generally speaking, the manufacturers there, other than of lumber, are opposed to the granting of the application, since to do so would open a new competitive field. Jobbers and distributors at the coast ports would benefit by having the large producing districts of the Middle West made available to them as additional sources of supply at lower rates than they now enjoy. They therefore favor the application.

The intermountain country, other than certain of the lumber, fruit, mining, and flour-milling interests, remains almost a unit in opposition to an adjustment of rates under which traffic would move through to the Pacific coast for a less charge for transportation than would be available to the territory intermediate thereto.

Eastern manufacturers and shippers also generally oppose the application. They contend that the relief sought is based on market competition rather than water competition and that such competition is not sufficient ground for fourth-section relief. They can see no justification for a basis of rates which will extend their natural advantage of proximity to economical water transportation to territory far inland and which will perhaps so seriously impair the earnings of the water lines as to result in the curtailment of service. It goes without saying that the water lines oppose the application. As above stated, carriers operating east of Chicago have not joined in the application although urged to do so by the western lines. The Boston & Maine and New York, New Haven & Hartford, New England carriers, actively oppose it.

The applicants assert that all they are asking for here is permission to make such rates as will afford them an opportunity to enjoy a fair share of the transcontinental traffic. They argue that no harm can come to the interior territory if a larger proportion of the traffic is diverted to the rail lines, since the Pacific coast can now obtain the same commodities at transportation costs lower than under the rates they are proposing, but that, on the contrary, the benefits which they may be able to realize will place them in position to afford all their patrons better service. They insist that it is not only their right but their duty, and that efficient management would require them, to employ all lawful means to secure a larger share of this traffic, if thereby they are able to increase their net revenues without burdening other traffic. They urge particularly that the relief sought will afford tonnage for empty cars moving westbound, of which there are apparently sufficient to transport all the traffic now carried by the water lines.

Rates Would Pay Something Above Out-of-Pocket Cost

Elaborate statistical data were introduced by the carriers to prove that the proposed rates would more than cover the extra expense of handling the additional traffic which they expect to obtain.

It will be observed that for a 40,000-lb. carload the maximum out-of-pocket cost shown is 63.36 cents per 100 lb., for a 50,000-lb. carload 55.79 cents, for a 60,000-lb. carload 50.74 cents, and for an 80,000-lb. carload 44.43 cents. As against these out-of-pocket costs the lowest rates the carriers are proposing are for a 40,000-lb. carload $1, for a 50,000-lb. carload 90 cents, for a 60,000-lb. carload 75 cents, and for an 80,000-lb. carload $16 per long ton, equivalent to 71.43 cents per 100 lb. In each case, therefore, the proposed rates materially exceed the out-of-pocket cost as computed by the carriers.

The computation of these costs has necessarily required numerous assumptions not susceptible of accurate determination. It can not be said with confidence that figures computed in this manner approximate the cost of the service. The same method as applied in the former case gave quite different results. These figures, however, are not seriously disputed by other parties to the record and may be accepted as indicating that the rates proposed would pay something over and above the out-of-pocket cost.

If the hopes of the western lines should be realized, a substantial volume of traffic would be diverted from interior eastern points of origin to Chicago territory. The eastern lines would then be deprived of the revenue which they now derive from the movement of such traffic to the Atlantic ports. No estimate of this loss appears in the record. With an all-rail movement from Chicago of 300,000 tons of iron and steel per year and a gain of 50 per cent because of the reduction in the rail rates the eastern lines would lose the revenue on 150,000 tons. If this tonnage should be lost to the Pittsburgh district the eastern lines would lose in the neighborhood of $1,000,000. At 40 cents per 100 lb. the loss to the water lines would exceed $1,000,000.

The gain to the western lines would about offset the loss to the eastern carriers and water lines. However, not only would the eastern carriers suffer a loss of revenue through a reduction in the water-borne traffic but the increase in the spread between the all-rail rates from Chicago and from the East would tend to deprive them of a considerable proportion of such traffic as now originates in the East and moves all rail.

The western lines claim that their investigation of the charges available from eastern manufacturing points by way of the canal demonstrates that the rates they are proposing are not lower than

necessary to meet the existing water competition, but are as high as they can be made and still attract the traffic. The water lines contend, however, and in this they are supported by many of the eastern and Pacific coast shippers, that when consideration is given to the incidental charges which must be paid on shipments moving by water, the disadvantages connected with water service, and the interest on the investment in the property being carried for the time required for the movement by water in excess of that required for rail transportation, the rates which the rail carriers are proposing are unjustifiably low.

It is unnecessary to proceed through the entire list of commodities enumerated in the application. Considered as a whole, it can not be said that the proposed terminal rates, with the exception of the rate on ammunition, are lower than would be necessary to permit the Middle West manufacturers to compete on relatively equal terms with manufacturers located at some distance from the seaboard who ship their products through the Atlantic ports. But before the relief from the operation of the fourth section which is here sought may be granted we must be satisfied that there would not thereby be created infractions of other provisions of the act, particularly those of section 3 prohibiting undue or unreasonable preference or advantage of or prejudice or disadvantage to persons or localities. We should likewise be convinced that the adjustment proposed will result in the substantial benefits which its proponents anticipate.

The relief sought is based primarily on market competition. Because Pittsburgh enjoys certain rail-and-water rates on iron and steel to the Pacific coast, the western carriers are proposing all-rail rates, not from Pittsburgh but from Chicago, approximately the same as the rail-and-water rates from Pittsburgh, and are blanketing those rates as to origin territory as far as the Colorado commonpoint line, departing from the blanket adjustment only at Minnequa, Colo., because of the order entered in *Colorado Fuel & Iron Co.* v. *Director General*, 57 I. C. C. 253, prescribing rates from Minnequa not in excess of 77 per cent of the rates from Chicago. Thus the natural advantage of location near the Atlantic seaboard which Pittsburgh enjoys is to be neutralized by extending it to points from 500 to 1,500 miles farther away. Manufacturers of other commodities in the Middle West would likewise be accorded a basis of rates to which they are not legitimately entitled by any natural advantage which they possess, whereas the manufacturers of the same commodities on the seaboard would have their advantage taken from them or diminished. While the manufacturers in the Middle West in effect would thus have accorded to them the advantage of proximity to water transportation, and would be placed more nearly on an equality with the eastern manufacturers with respect to shipments of the latter moving to the Pacific coast ports through the canal, they would not only continue to enjoy the advantage of their more westerly location on traffic moving all rail from the East, but this advantage would be increased.

Commission Not Convinced of Benefits

The record is far from convincing that the establishment of the proposed rates will result in the benefits which the applicants anticipate. It appears that when the reduction of 35 cents was made in the rates on iron and steel articles from Chicago to the Pacific coast terminals in April, 1923, no real benefit accrued to the Chicago mills, nor was the situation materially helped when the water lines increased their rate from 30 to 40 cents some months later. The traffic continued to move from the eastern mills, many of which are nearer the seaboard than is Pittsburgh. It is said that to meet the competition of the mills east of Pittsburgh it would be necessary to establish a rate from Chicago as low as 60 cents.

The proposed rates on iron and steel articles, from which the applicants hope to obtain their greatest increase in net revenue, might be expected to divert some of the traffic which now originates in the Pittsburgh district if the rail-and-water rates from Pittsburgh remain the same. There is no assurance, however, that the eastern rail carriers and particularly the water lines would permit any substantial diversion of their traffic without making an effort to retain it. They would be urged to take this action by eastern manufacturers whose business would suffer through loss of their Pacific coast trade, and the record shows that in one instance a committee has already been appointed to appeal to them for offsetting rate reductions in the event the proposed rates are permitted to become effective. A slight reduction in the water rate would suffice to retain the advantage to the rail-and-water route, and this would call for further reductions in the rates of the western carriers to bring about the near equalization of the Middle West and eastern markets. On the other hand, if the western carriers were not inclined to meet reductions in the water or rail-and-water rates the competitive situation would remain as it is at present, the revenues of the applicants and the water lines would be unnecessarily reduced, and the Pacific coast shippers would receive the only advantage.

The opportunity for shrinkage in the rail-and-water rates from interior eastern points will be clear when it is borne in mind that the eastern carriers now charge full local rates to the seaboard, and that it is more profitable for the water lines to accept westbound traffic at very low rates rather than that their ships shall sail under ballast.

Effect on Water Lines

There is another phase of this matter which must not be overlooked. Section 500 of the transportation act, 1920, declares the policy of Congress to be "to promote, encourage, and develop water transportation, service, and facilities in connection with the commerce of the United States, and to foster and preserve in full vigor both rail and water transportation."

If the hopes of the applicants should be realized the benefits which they as a whole might obtain from the granting of the application would be greatly disproportionate to the loss which the water lines would suffer. The record shows that the total tonnage, both eastbound and westbound, of all the water lines is but a very small fraction of that of the transcontinental carriers operating west of Chicago. It is evident, therefore, that the diversion of any substantial tonnage from the water lines would have but an inappreciable effect on the net revenues of the rail carriers. On the other hand, it might very seriously impair the ability of the water lines to maintain their present standard of service.

Regulation of Water Lines Urged

LEWIS, *Commissioner*, concurring:

This case emphasizes the necessity of placing the intercoastal water lines under the same regulation as that to which the transcontinental rail lines are subjected. The rail lines are placed at a very unfair disadvantage. They are held to rigid restrictive requirements. Their competitors, some of which have most affluent affiliations, may war to the hilt with cut rates without hindrance. There is ample reason afforded by the record before us to forecast that if the railroads were granted fourth-section relief herein prayed, competitive water carriers, if not themselves moved to protect their tonnage, would bend to the demand of industry or sections served. The result would be that the cut made by the land carriers would be met and the flow of traffic would be maintained as at present. The western carriers would be hauling traffic to the ports for a million dollars less than at present, the eastern carriers would be worse off, and the water carriers would also be weaker—all quite contrary to the mandate that both land and water transport be maintained in full vigor. If the water lines should later find it desirable to withdraw their cut rates, they would be quite free to do so. The rail lines, however, would be trapped. Their rates would be held to that low level to which they had been reduced to meet water competition, until the carriers were able to justify increases on the grounds of "changed conditions other than the elimination of water competition"; and experience has demonstrated upward revision is most difficult to obtain.

I fail to see the justice of subjecting one interstate carrier to regulation and leaving the other to sail the seas free to scuttle both itself and its land competitor, or how there can ever be brought about an understanding and solution of this contest until both carriers are placed under one agency of regulation.

WOODLOCK, *Commissioner*, concurring:

I concur in the result reached by the majority, but I do so mainly for reasons other than those given in the report. The main consideration which influences me is the present unsettled status of the canal as regards vessel rates on coast-to-coast business.

The canal was built with public money for the combined security and benefit of all the people of the United States. It is a new piece of transportation machinery which should be co-ordinated with, and adjusted to, the existing railroad system of the country, so that the best results may be obtained from both. The public is entitled to the fullest possible exploitation of the legitimate capacity of the canal for economical transport of freight by ships, between the two coasts. Whatever may be that capacity, it should be recognized, appraised, and expressed in the rates on water-borne traffic through the canal. These rates should be stable and public, and should be subject to the same regulatory authority as that which controls the rail rates; otherwise no co-ordination of rail and water will be possible. Only after prescription of a reasonable *minimum* rate tariff on water-borne traffic between the coasts will it be possible to measure the permanent effect of the canal upon the railroad structure, and to deal with the railroad rate structure intelligently. To attempt to do so at present, with canal rates neither stable nor public, would be but to incur serious risk of wide disturbance in both rail and water rates with consequent unnecessary and uneconomic loss of revenue to all concerned. The first and most necessary step to a proper settlement of the matter is to place the canal rates under the regulative jurisdiction of this commission with a view to prescription of minimum coast-to-coast rates. In my judgment, the Congress should legislate to this effect at as early a date as possible.

Whether or not, this having been done, fourth-section relief should then be granted to the transcontinental lines will be a question to be settled in the light of the facts as they may then appear.

Fourth Section Legislation Unsound

Section 4 adds nothing essential to the act. It is merely a special expression of something which is already contained in preceding sections. The first three sections of the act deal with the fundamentals of rates. A rate which is reasonable, i. e., not too high, but properly compensatory, under section 1, and which is neither unduly preferential nor prejudicial, under section 3, is a just, fair, and equitable rate whether or not it be lower for the longer distance than for the shorter distance. No rate can properly be permitted under fourth-section relief which does not fulfill the conditions imposed by sections 1 and 3. From this is readily apparent the fundamental unsoundness of legislation looking to absolute exclusion of such relief. It is also apparent that to prohibit fourth-section relief in the case of "water competition" or "market competition" is equally unsound. What good reason can exist for prohibiting the making of rates which are in themselves just, and lawful under sections 1 and 3? To do so would be to prefer one kind of transportation, or one district as against another, and thus prevent the full and free play of that kind of competition of which the act, both in letter and spirit, enjoins the preservation.

In my opinion the situation as it stands today is not ripe for action such as is requested by the carriers. Whether it ever will be is an open question. The answer to it can be determined only when the canal has been definitely adjusted to the transportation system of the country, as above suggested.

Three Commissioners Dissent

ESCH, *Commissioner*, dissenting:

I do not agree with the conclusion of the majority that this application should be denied, nor am I satisfied with the statement of facts in the majority report, and in view of the importance of the case, I am setting forth at some length my views upon the facts shown of record.

The facts which stand out in greatest prominence in this case are as follows:

1. We granted fourth-section relief to the rail lines when the water competition was much less severe than at present, and in discontinuing the relief because of the temporary withdrawal of the ships from the intercoastal trade, we recognized the necessity for relief under normal conditions and invited the carriers to file an application when the water competition returned.

2. The tremendous increase in the water competition since the hearings on the 1921 application, and its effect upon the industries of the Middle West as well as the western railroads.

3. The extensive westbound movement of empty cars, which could be handled under load at but little additional expense.

4. The only parties who are really opposed to the maintenance of higher rates to intermediate points than to the ports, and whose interest is not merely to prevent any reduction in the rates from the Middle West, are the so-called intermountain interests, and some of the most important industries in the intermountain territory supported the application.

5. Whether the competition under consideration be called water competition or market competition, it is a proper ground for fourth-section relief as shown by the cases cited in this dissent.

6. The proposed rates with one exception comply with all of the essentials of a reasonably compensatory rate as defined in *Transcontinental Cases of* 1922.

7. The rates to intermediate points are as low as or lower than the rates prescribed or approved in previous decisions, and we could not find them unreasonable upon this record.

8. The majority report does not, and could not, find that the proposed rates would create undue prejudice against either the intermountain jobbers or the eastern manufacturers, particularly if the relief were granted upon condition that poportional rates be established for application on traffic from points east of Group D upon the basis herein described.

9. Denial of the application will give the water lines a virtual monopoly of all the traffic which they are in a position to handle, which does not appear to be in harmony with section 500 of the transportation act.

Net Increase in Revenues

10. The granting of the application would afford the western lines a much needed increase in their westbound traffic and net revenues, enable the Middle West to prosper in competition with the East on approximately equal rates to the Pacific coast, and relieve the burden on other traffic, particularly that produced in the Far West and shipped east.

It might reasonably be assumed that the rail carriers should regain one-half of the total Pacific coast tonnage of the commodities covered by the application, which they apparently had when the last application was decided, but if they should only increase their tonnage to the extent of the excess of the westbound tonnage of general cargo over the corresponding eastbound tonnage of the canal lines, such increase would have amounted to approximately 664,000 tons in 1923. The proposed rate of 80 cents on iron and steel articles, minimum 80,000 lb., is about the lowest of the rates proposed from Group D; at least, it may safely be assumed that it is not in excess of the weighted average on all of the traffic covered by the application. The 664,000 additional tons at 80 cents per 100 lb. would increase the gross revenue of the western carriers more than $10,000,000 per year. Taking into consideration the out-of-pocket costs of handling such traffic, which are shown as from 33.72 to 44.3 cents per 100 lb. for an 80,000-lb. carload from Group D, the increase in the net revenues of the western carriers would be from about $4,700,000 to $6,100,000 per year. After deducting for the loss on existing all-rail traffic, the net increase in revenues over and above the extra expense of handling the traffic would still be somewhere around $4,000,000 or $5,000,000 per year.

Such increased revenue would to that extent have relieved the burden resting upon the shipping public, which is now confronted by an application of the western lines for a general increase in their rates in order to enable them to earn the fair return contemplated by law.

I am authorized to say that COMMISSIONERS MEYER and AITCHISON join in this dissent.

COMMISSIONER HALL did not participate in the disposition of this proceeding.

Revenue Ton-Miles of Freight in 1925 Exceeded Previous Records

WASHINGTON, D. C.

REVENUE freight traffic handled by the Class I railroads in 1924 amounted to 414,139,835,000 ton-miles, as compared with 388,865,683,000 ton-miles in 1925 and 412,727,228,422 in 1923, according to the Interstate Commerce Commission's monthly bulletin of revenue traffic statistics, excluding switching and terminal companies. Earlier statistics covering net ton-miles, including both revenue and non-revenue freight, showed 1925 as falling below the corresponding figures for 1923 by three-tenths of one per cent, but the revenue traffic figures show that 1925 broke all records, just as the weekly figures for revenue freight car loading broke all previous records. The 1923 net ton miles included a larger percentage of company freight, presumably largely attributable to the fact that the railways in that year took a large amount of company coal into storage.

The revenue tons carried in 1925, however, were less than in 1923, amounting to 2,280,090,000, as compared with 2,147,325,000 in 1924 and 2,333,600,764 in 1923. The average haul per road was 181.63 miles as compared with 181.09 in 1924.

Freight revenue in 1925 amounted to $4,546,670,891, as compared with $4,339,991,282 in 1924. The average revenue per ton-mile was 1.098 cents, as compared with 1.116 cents in 1924, and the average revenue per ton per road was $1.99 as compared with $2.02.

The revenue passenger-miles for 1925 amounted to $35,963,862,000, as compared with $36,123,757,000 in 1924; the passenger revenue was $1,055,273,357 as compared with $1,075,883,951, and the average revenue per passenger-mile was 2.934 cents as compared with 2.978 cents. The average miles per passenger per road in 1925 was 40.56 as compared with 38.79 in 1924.

ON THE TOLEDO DIVISION of the Pennsylvania a movement has been started to plant flower beds around all stations this spring. The action was taken by the agents themselves who will not only fertilize the beds but will procure the flower seeds locally, and will, without assistance from any source, develop the plan on their own initiative.

Regenerative Braking for Multiple Unit Trains

By L. M. Aspinwall
Railway Equipment Engineer Westinghouse Electric & Manufacturing Company.

A SCHEME of regenerative braking for use on multiple unit cars has been developed by Westinghouse engineers and equipments are now being tested in actual service on the Chicago Rapid Transit lines. The operation is proving to be very satisfactory.

Regenerative braking has been in use for some years on electric locomotives operating on electrifications where long heavy grades exist. Such applications have been justified by the saving in power, reduction in brake shoe wear and the ease and greater safety of train operation.

In multiple-unit train service the runs are generally comparatively short and the schedule speeds high, with the result that braking is started at high speeds and a large percentage of the energy taken from the line is wasted in heat at the brake shoes. On this account, the application of regenerative braking to service of this character offers possibilities of thoroughly beneficial returns.

Regenerative braking on electric locomotives is a comparatively simple matter, for in this case the usual problem is to maintain a constant speed down a long grade. In the case of multiple-unit trains operating on a high schedule speed with frequent stops, the problem becomes a more difficult one. In this case, it is necessary to be able to start braking instantly at widely varying speeds, to be able to maintain a practically constant rate of braking over a period during which the speed is rapidly falling, and finally, to glide smoothly from regeneration to air braking for the final stop.

The system developed is particularly suitable for two-motor, double-truck cars of the type which are common in subway and elevated service. Two axle-driven machines mounted on the trailer axles supply exciting current for the fields of the main motors during the braking period, and act as motors during the period of acceleration. On account of this motoring action during acceleration, these machines are designated as "boosters." The booster armatures are connected in series with the main motors during acceleration, and their fields are separately excited.

The design and gearing of the axle machines are such that when motoring they add approximately 25 per cent to the tractive effort supplied by the main motors. This additional tractive effort is obtained principally from energy which usually is wasted in resistance so that this is a gain aside from the regenerative feature.

A feature of the system is the use of a constant time element sequence switch for bringing in the correct switches during the braking period and for regulating the field strength of the "booster." The system also embodies means for regulating the regenerative currents, for balancing the generated voltage against the line voltage and for cutting in and out the air brake so that it will act in proper conjunction with the regenerative system.

The regular equipment on the car consists of two Westinghouse type 567-R-1 motors with a gear ratio of 17:60 and Westinghouse automatic electro-pneumatic control. The equipment added for regeneration comprised two "booster" motors, an air-operated sequence switch, four electro-pneumatic switches, two engineer's brake valve switches and several relays. The weight of the added equipment is approximately 4,500 lb. and the total weight of car with the additional equipment is about 79,000 lb. The equipment on this car is so arranged that the master controller and engineer's brake valve are handled in precisely the same manner as in the case of the ordinary non-regenerative equipment. When the master controller handle is thrown to the "full on" position, the acceleration takes place in the usual manner, except that the "boosters" act as motors and assist the main motors to bring the car up to speed. When full parallel position is reached, the "boosters" are automatically cut out of circuit.

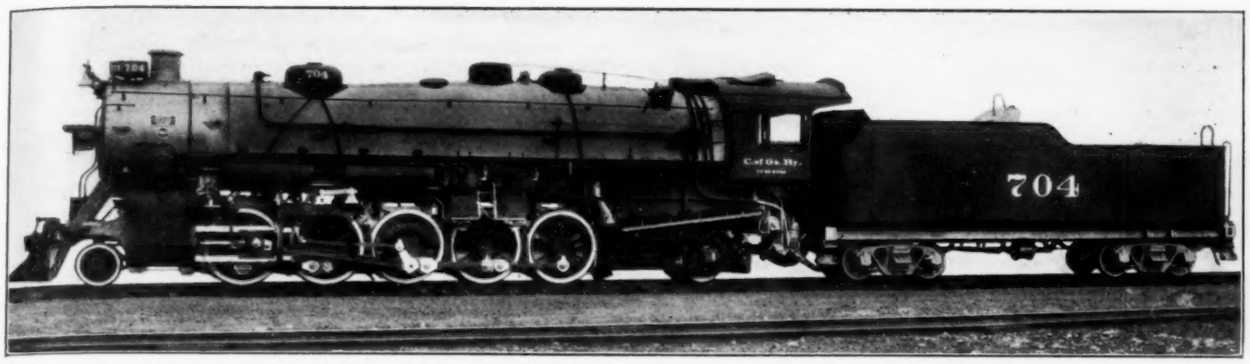
When the master controller handle is thrown to the "off" position, the proper connections are automatically established so that the main motor fields are excited by the "boosters" to such a strength that a voltage equal to a little more than line voltage will be generated across the motor armatures. This generated voltage is automatically maintained within fixed limits as the car drifts to lower speeds, so that this "stand by" position is maintained ready to start braking at any instant.

When braking is desired, the engineer's brake valve handle is moved to "service" position and the desired reduction in brake pipe pressure is made in the usual manner. The moving of the brake handle to "service" closes a pair of contacts in an attachment which is mounted on top of the engineer's brake valve in place of the usual handle guard. This action closes the line switches and throws the motors onto the line. At the same moment that the line switches are closed, the fields of the "boosters," which are exciting the main motors, are strengthened by cutting out a certain amount of resistance and the sequence switch which governs these fields starts to revolve at a constant speed.

The result of these operations is to start regenerative braking immediately when the handle is moved to "service" position. These take place before the air brake has had time to come into action. The current which is regenerated to the line closes a series relay and blocks off the connection between the brake cylinder and the triple valve so that no air passes to the cylinder in spite of the fact that a reduction has been made in the brake pipe pressure. The sequence switch as it revolves at constant speed gradually cuts out resistance in the "booster" fields and at the same time carries the motor connections through a bridging transition from the parallel to a series combination, with the result that the regenerative braking is maintained at a practically constant rate down to a speed of approximately ten miles an hour. At a speed of approximately 12 miles per hour, the air brake is automatically cut in, and when the pressure in the brake cylinder has reached a given value, the regenerative braking is cut out automatically. The pressure attained in the brake cylinder at this time is governed by the reduction which was made in the brake pipe pressure at the time that regenerative braking was started.

During the tests on the car made on a test track at East Pittsburgh, Pa., the transition from regenerative to air braking was made so smoothly that it was hard to detect when the change took place without watching the instruments which were in circuit. The final spotting of the car is taken care of in the usual way by manipulating the air brake. The connections on the car are such that if regenerative braking fails to act for any reason, the air brake comes into action in the regular way. The emergency or the engineer's brake valve is left intact so that air braking is always obtained on this position.

One of the two cars equipped has received very elaborate laboratory tests and a second car equipped with identical apparatus is being tested under service conditions in typical Chicago Elevated service.



Santa Fe, 2-10-2 Type Locomotive with a Tractive Force of 73,830 lb.

Central of Georgia 2-10-2 Locomotives

Develops 73,830 lb. tractive force with 190-lb. pressure, 30-in. by 32-in. cylinders and 63-in. driving wheels

THE marked increase in traffic which has recently taken place on the railroads of the south, is taxing existing facilities severely and necessitating the use of the heaviest motive power permitted by track and bridge conditions. The Central of Georgia is no exception in this respect; and it is steadily improving its property with a view of maintaining a high standard of service.

The latest addition to the motive power equipment is a group of ten locomotives of the 2-10-2 type, recently completed by the Baldwin Locomotive Works, Philadelphia, Pa. These locomotives exert a tractive force of 73,830 lb. and are designed to traverse curves of 18 deg. Many of their principal dimensions accord with those of the heavy standard 2-10-2 type locomotives built for the United States Railroad Administration. In the design of the details, however, the new locomotives show many differences.

The heaviest locomotives previously built for the Central of Georgia by the Baldwin Locomotive Works were of the Mikado 2-8-2 type and were placed in service early in 1925. A comparison of their principal dimensions with those of the new 2-10-2 type locomotives is given in the table. The new locomotives represent an increase in tractive force of 35 per cent, with approximately equivalent increases in weight, heating surface, and grate area.

COMPARISON OF THE PRINCIPAL DIMENSIONS OF THE CENTRAL OF GEORGIA 2-10-2 AND 2-8-2 TYPES

Type	2-8-2	2-10-2
Cylinders	27 in. by 30 in.	30 in. by 32 in.
Drivers diameter	63 in.	63 in.
Steam pressure	185 lb.	190 lb.
Grate area	70.5 sq. ft.	88.3 sq. ft.
Water heating surface	4,094 sq. ft.	5,233 sq. ft.
Superheating surface	905 sq. ft.	1,285 sq. ft.
Weight on drivers	226,760 lb.	309,220 lb.
Weight total engine	298,090 lb.	401.480 lb.
Tractive force	54,500 lb.	73,830 lb.

The 2-10-2 type has a conical boiler, 100 in. in diameter at the largest course. The firebox has a 5-ft. combustion chamber, and it contains two Nicholson Thermic Syphons and three arch tubes. A Duplex stoker is applied. These locomotives have lateral motion boxes on the front pair of drivers, and plain tires on the middle main pair. The leading truck is of the constant resistance type, while a Delta trailing truck is used in combination with the Commonwealth rear frame cradle. The main frames are 6-in. wide with double front rails, the top rails being bolted and keyed to the main sections. Special attention has been given to providing ample support for the boiler barrel on the frames. The waist sheet and guide bearer are not attached to the boiler, but bear against external liners which are riveted to the shell.

The piston heads are of rolled steel with gun iron bull and packing rings, and the piston rods are of carbon vanadium steel. The latter material is also used for the main crank pins and the main and side rods. The back ends of the main rods, and the side rod stubs on the main pins, are fitted with floating bushings. A force feed lubricator, with six feeds, is applied, and is operated from one of the link trunnions. One feed runs to each cylinder, one to each steam chest, one to the two New York duplex air-pumps and one to the stoker engine.

The valve gear is of the Walschaert type controlled by a power reverse mechanism. On one locomotive the eccentric cranks are set to give a variable lead, amounting to 1/16 in. in full gear forward, ¼-in. in midgear and 7/16 in. in full gear backward. On the remaining locomotives, the motion is designed to give a constant lead of 3/16 in.

These locomotives are equipped with flange oilers on the first and second pairs of driving wheels, and also with pipes for washing the sand from the rails back of the rear drivers.

The tenders have Commonwealth cast steel frames, and water bottom tanks of 12,000 gal. capacity. The coal capacity is 16 tons. Further particulars are given in the table of dimensions and proportions:

Railroad	Central of Georgia
Type of locomotive	2-10-2
Service	Freight
Cylinders, diameter and stroke	30 in. by 32 in.
Valve gear, type	Walschaert
Valves, piston type, size	15 in.
Cut-off in full gear, per cent	85
Weights in working order:	
On drivers	309,220 lb.
On front truck	30,270 lb.
On trailing truck	61,990 lb.
Total engine	401,480 lb.
Tender	208,020 lb.
Wheel bases:	
Driving	22 ft. 4 in.
Total engine	42 ft. 6 in.
Total engine and tender	82 ft. 5 in.

Wheels, diameter outside tires:
- Driving ..... 63 in.
- Front truck ..... 33 in.
- Trailing truck ..... 44 in.

Journals, diameter and length:
- Driving, main ..... 12½ in. by 13 in.
- Driving, others ..... 10 in. by 13 in.
- Front truck ..... 6½ in. by 12 in.
- Trailing truck ..... 9 in. by 14 in.

Boiler:
- Type ..... Conical
- Steam pressure ..... 190 lb.
- Fuel, kind and B. t. u. ..... Bituminous
- Diameter, first ring, outside ..... 88 in.
- Firebox, length and width ..... 132⅛ in. by 96¼ in.
- Height mud ring to crown sheet, back ..... 70½ in.
- Height mud ring to crown sheet, front ..... 94½ in.
- Arch tubes, number 3
- Combustion chamber length ..... 5 ft.
- Tubes, number and diameter ..... 50—5½ in.
- Flues, number and diameter ..... 271—2¼ in.
- Length over tube sheets ..... 20 ft. 6 in.
- Grate area ..... 88.3 sq. ft.

Heating surfaces:
- Firebox and comb. chamber ..... 389 sq. ft.
- Arch tubes ..... 27 sq. ft.
- Thermic syphons ..... 88 sq. ft.
- Tubes and flues ..... 4,729 sq. ft.
- Total evaporative ..... 5,233 sq. ft.
- Superheating ..... 1,285 sq. ft.
- Comb. evaporative and superheating ..... 6,518 sq. ft.

Special equipment:
- Brick arch ..... Yes
- Superheater ..... Yes
- Stoker ..... Yes

Tender:
- Style ..... Rectang. water bottom
- Water capacity ..... 12,000 gal.
- Fuel capacity ..... 16 tons

General data estimated:
- Rated tractive force, 85 per cent ..... 73,830 lb.
- Cylinder horsepower (Cole) 3,082

Weight proportions:
- Weight on drivers ÷ total weight engine, per cent. 77.1
- Weight on drivers ÷ tractive force 4.19
- Total weight engine ÷ cylinder hp 130.1
- Total weight engine ÷ comb. heat. surface 61.5

Boiler proportions:
- Comb. heat surface ÷ cylinder hp 2.11
- Tractive force ÷ comb. heat. surface 11.29
- Tractive force × dia. drivers ÷ comb. heat. surface. 711
- Cylinder hp. ÷ grate area 35.13
- Firebox heat. surface ÷ grate area 5.67
- Firebox heat. surface, per cent of evap. heat. surface. 9.57
- Superheat. surface, per cent of evap. heat. surface. 24.5

Freight Claims Reduced in 1925

Prevention work of the railroads and shippers described at Southwestern Claim Conference

THE freight claims paid during 1925 by the railroads in the United States aggregate about $38,000,000, or approximately $8,000,000 or 17 per cent less than in 1924, according to statements made by A. L. Green, special representative, committee on freight claim prevention, American Railway Association, at the Southwestern Claim Conference at Dallas, Tex., on January 19. The meeting, which was attended by railroad and shipping interests of the southwest, considered freight claims and their prevention from both the railroads' and shippers' points of view.

The conference was a joint meeting with the Traffic Club of Dallas and the Dallas Chamber of Commerce. W. M. Whitenton, vice-president of the Missouri-Kansas-Texas, spoke on freight claim prevention from the operating standpoint; J. L. West, manager of the transportation bureau of the Dallas Cotton Exchange, spoke on the relations of the freight claim department to cotton transportation; Jesse M. Allen, president of the Traffic Club of Dallas, and commercial agent of the Chicago, Milwaukee & St. Paul at Dallas, spoke on the three views of the claim situation; R. C. Andrews, district manager of the Car Service Division of the American Railway Association, spoke on the activities of our shippers' advisory board; A. H. McKnight, president of the Texas Bar Association, spoke on reciprocity in claim settlements and H. B. Lockett, traffic manager of the John Deere Plow Company, spoke on the industrial traffic man's views of the claim situation. Others addressing the meeting were A. V. Tate, chief clerk in the general claim department of the Gulf, Colorado & Santa Fe, C. H. Dietrich, chairman of the Freight Claim Division of the American Railway Association, and R. C. McElree, agent of the Gulf, Colorado & Santa Fe.

Number of Claims Presented Decreased

The address made by Mr. Green described the claim prevention work done during 1925 and showed the results attained. The data used were estimated from figures compiled during the first ten months of the year and vary from those published in the *Railway Age* of January 23, the latter including Canadian railroads and steamship lines and being based on nine months of the year. Mr. Green spoke in part:

"The number of claims presented was reduced from 2,498,790 in 1924 to approximately 2,420,000, and the number of claims pending dropped from 228,659 at the close of 1924, to approximately 200,000 at the close of 1925. Claims were put through in record time, 69 per cent having been adjusted within 30 days of presentation and 88 per cent in 90 days. If many claimants had supported their claims in better shape when presented, and furnished evidence more promptly when requested, even this record would have been surpassed.

"A survey made during the year shows that differences which arise over the settlement of claims were comparatively few. Not more than one-half of one per cent of the number of claims presented ever reached the courts and probably over half of those cases were settled amicably, without going to trial.

"A detailed account of the claim situation during 1925 as compared with previous years is shown as follows:

FREIGHT LOSS AND DAMAGE

	1914	1920	1921	1922	1923	1924	1925
Number of claims presented	*3,231,230	4,721,497	‡2,947,528	2,351,412	2,833,984	*2,498,790	2,420,000
Amount paid	$33,671,219	$119,833,127	$92,276,319	$48,084,955	$48,471,466	*$45,975,675	$38,000,000
Ratio of amount paid to gross freight earnings	1.59%	2.78%	2.36%	1.20%	1.03%	1.06%	*0.84%
Amount paid for each rev. car loaded	†	$2.65	$2.35	$1.11	$0.95	$0.95	*$0.74
Amount paid for each million revenue ton miles	$116.78	$292.06	$297.67	$141.54	$116.02	$118.25	*$92.68
Number claims presented for each million revenue ton-miles	11.2	*11.5	9.5	6.9	6.8	6.4	*5.9
Per cent of claims settled in 30 days	69	†	58	66	66	68	*69
Per cent of claims settled in 90 days	84	†	78	86	86	86	*88
Number of claims unsettled at end of year	328,271	542,393	273,018	290,000	297,004	228,659	*200,000

*Estimated. †Not available. ‡Decrease largely due to 1921 slump.

"It will be noted that for each million revenue ton-miles of service performed in 1914, $116.78 was spent for freight loss and damage, $292.06 in 1920, and only about $92.68 in 1925, despite the fact that commodity prices were from 50 to 60 per cent higher than in 1914. Average claim payments per revenue car loaded have also come down from $2.65 in 1920 to $0.74 in 1925. Of course claim payments are not allocated to the traffic period; but considering the promptness with which claims are settled these figures indicate the trend with fair accuracy.

"One of the outstanding achievements has been the great reduction in losses by theft and robbery. Compared with 1920, these claims were reduced 88 per cent, and in 1925 theft losses were 33 per cent less than in 1924. A comparison by years is shown in the following table:

CLAIMS PAID, ACCOUNT THEFTS AND ROBBERIES

1914	$1,843,409
1920	*12,875,000
1921	9,924,747
1922	4,806,720
1923	3,117,484
1924	2,276,995
1925	*1,520,000

*Estimated.

"These figures include all claims paid for freight which disappeared under circumstances indicating theft, and when it is considered that in 1925 about 32,000,000 cars were loaded with l.c.l. merchandise or manufactured goods, and that each l.c.l. car, of which there were 13,000,000, contained an average of about 180 packages of freight, excluding the articles shipped 'loose', the question may well be asked whether goods are not safer from thieving while in custody of the railroad than anywhere else in the world outside of a bank vault.

"Probably the elimination of delays has been responsible as much as any one factor for the reduction of car robberies. Other factors are the greatly increased efficiency of the railway police departments; better packages and the more general use of box-strapping; the thorough analysis of short reports to determine where pilferies are occurring, and increased co-operation between claim, prevention and police departments and among carriers in reporting losses. The local freight agent is doing a much better job of supervision, and the new equipment with burglar-proof car doors handicaps the thief. It is still possible, however, for a valuable package to check short from a car and not be reported to the loading station on another line until too late for effective action. During the year a uniform report was adopted for reporting robberies to interested carriers. If each line will check up its practice and see that connections and originating lines are given full and prompt information of known or suspected robberies, and especially of all valuable merchandise failing to arrive after a reasonable time, theft losses can be still further reduced.

"Closely associated with theft claims are those for unlocated losses of entire packages, the cause of which could not be determined at time of payment, but of which possibly 50 per cent were due to theft if the true cause could have been ascertained. These claims which exceeded $19,000,000 in 1920 are estimated at $2,356,000 for 1925, contrasted with $5,156,319 in 1914, when prices were at least 50 per cent lower. About one-third of the total represents shortages from carload shipments which are loaded by shipper, unloaded by consignee or not handled or checked by carrier at either end. The following figures show how these claims, both absolutely and relatively, have been brought down:

LOSS OF ENTIRE PACKAGES. CAUSE UNDETERMINED

		Per cent of all claims
1914	$5,156,319	15.9
1920	*19,275,000	15.6
1921	13,171,035	13.6
1922	5,026,332	10.5
1923	4,002,221	8.1
1924	3,370,467	7.0
1925	*2,356,000	6.2

*Estimated.

"To the district claim conferences is due much credit for reducing the risk of losses of merchandise in transit. In many instances committees representing these conferences did a prodigious amount of work in organizing freight agents at common points so that over and astray freight would be promptly reported to each agent, connected with revenue billing, and claims paid only when the property was actually lost. A perfect package month campaign in November, 1921, brought good results and developed that about 50 per cent of all irregularities discovered were in the marking of freight by shippers. That this is still responsible for a great many shipments going astray is evident from the fact that during 1925 the Western Weighing & Inspection Bureau merchandise inspectors operating in only twelve cities rejected 284,830 packages for improper marking out of a total of 424,895 packages condemned for various reasons at the receiving station. There is a good field here for further training of receiving clerks in the classification marking rules, and for education of shippers, particularly those who use second-hand containers. It is also a fact that astray freight reports are not exchanged as freely at some common points as should be, and claims are being paid right along on carload shipments which could easily be prevented by more attention to loading and checking methods of shippers and receivers. One of the railroads has adopted a special form of carload loss and damage report and is going into these questions extensively.

"Rough handling of cars and unlocated damage when the cause is unknown, are by far the largest items in the claim account and, relatively to the whole, have shown steady increases. These claims took about 30 per cent of the grand total in 1921 and 40 per cent in 1925, although the amounts paid dropped from $28,300,000 to approximately $15,000,000. How much of this was really due to poor packing and improper stowing and bracing of goods in cars cannot even be guessed; but enough of it resulted from unnecessary rough switching to make intensive prevention efforts well worth while. At the present time most of the roads operating in Chicago are showing to day and night forces a motion picture on careful versus careless switching, produced by one of the railroads. A series of educational motion pictures covering all important conditions that enter into the rough handling problem could be used to good advantage. A cheap, efficient impact register is needed.

"New furniture continues to contribute more heavily to the claim account than any other manufactured commodity. A certain amount of damage is to be expected. However, a large number of inspections in different parts of the country, and the opinion of competent authorities indicate that a substantial improvement in crating methods, and in the manner in which articles are packed in crates, is possible, and that more frequently than not the change in design can be made at an actual saving to the shipper. During the past year an engineer of the Freight Container Bureau, A. R. A., in addition to studying the problem in furniture factories, has been educating prevention representatives of several roads so that they may intelligently assist manufacturers on their lines with their packing problems. The remedy lies in more careful

handling by the railroads and in ascertaining which shippers are in need of educational service and giving them that service rather than filling the freight classification with lengthy technical regulations which the average manufacturer might have difficulty in understanding and which would be very hard to enforce because so few railroad men could apply them. It is believed that present regulations are generally adequate, dealing, as they do, with fundamentals, and that more can be accomplished along educational than legislative lines.

"The chief cause of egg damage in the past has been the bending and collapsing of the frail filler tips, allowing eggs to come directly in contact with the boards in the center and ends of the case. The trouble is completely corrected by the new non-skid flat, which takes the strain off the filler tips and transfers the shocks received in transit directly to the case. It has the further advantage of usually increasing the market value of eggs because of its well known ability to carry eggs safely and because they present a more attractive appearance to the buyer when so packed. The relative merits of various methods of packing eggs were brought out in a test conducted jointly by Swift and Company and the U. S. Department of Agriculture last year, under the auspices of a committee representing the trade, packing supply manufacturers and transportation interests.

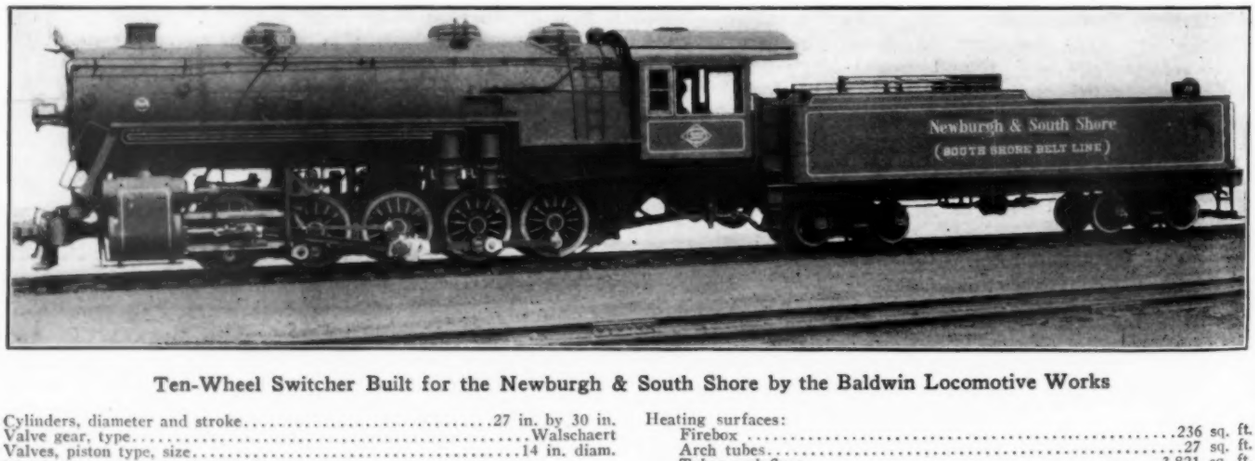
"Twelve carload shipments, packed in eight different ways, were tested in commercial movement, and the test proved that eggs properly packed and loaded will carry safely under all ordinary conditions of transportation. The Department of Agriculture will shortly have available 10,000 copies of a report of this investigation for distribution to those interested.

"The sewer pipe problem is as complicated and expensive as ever. The amount paid in claims shows a slight increase, which is about offset by increased production. A committee representing the Transportation, Mechanical, Traffic and Freight Claim Divisions of the American Railway Association is in touch with shippers' associations with a view to testing, under commercial conditions, various suggested methods of loading clay products to see whether present methods can be improved. The greatest saving and protection to carriers, however, will come from the employment of expert inspectors in Southern, Eastern and Central Inspection Bureau territories, along lines followed so successfully in the Western territory. As it is now, these claims aggregate one million dollars per annum, equal to more than 10 per cent of the gross freight revenue, and frequently include large numbers of tile broken or rejected through no fault of the carriers.

"The railways are also interested in the claim prevention efficiency of the American Railway Express Company, because claim payments are taken care of, as an operating expense, before any revenue from express is received by the railway company. The following statement shows the excellent progress made in eliminating causes for express claims:

AMERICAN RAILWAY EXPRESS COMPANY, LOSS AND DAMAGE RECORD

	1921	1922	1923	1924	First 9 mos. 1925
Number of claims presented	781,762	532,613	565,269	467,066	352,701
Number of claims presented for each 1,000 shipments handled.	4.02	2.96	2.98	2.57	2.63
Amount paid	13,224,593	5,088,374	5,281,538	4,193,229	3,194,321
Ratio of amount paid to revenue	4.49	1.75	1.71	1.46	1.52
Average salary cost per claim disposed of	$1.29	$1.18	$1.09	$1.19	$1.14
Average number of days between presentation and payment	84	62	50	47	44
Total number claims placed in litigation during year	5,933	4,546	4,294	1,631	1,072
Total amount of claims placed in litigation during year	1,188,894	703,988	672,154	397,882	287,394
Total number no mark shipments	23,197	24,099	31,559	22,228	17,409



Ten-Wheel Switcher Built for the Newburgh & South Shore by the Baldwin Locomotive Works

Cylinders, diameter and stroke	27 in. by 30 in.
Valve gear, type	Walschaert
Valves, piston type, size	14 in. diam.
Weights in working order:	
On drivers	293,000 lb.
Total engine and tender	467,200 lb.
Wheel bases:	
Driving	20 ft.
Total engine and tender	65 ft. 8½ in.
Wheels, diam. outside tires:	
Driving	54 in.
Boiler:	
Type	Straight top
Steam pressure	200 lb. per sq. in.
Fuel, kind	Bituminous
Diameter, first ring	86 in.
Firebox, length and width	120 7/8 in. by 84¼ in.
Tubes, number and diameter	45—5½ in.
Flues, number and diameter	262—2 in.
Length over tube sheets	19 ft.
Grate area	70.2 sq. ft.
Heating surfaces:	
Firebox	236 sq. ft.
Arch tubes	27 sq. ft.
Tubes and flues	3,821 sq. ft.
Total evaporative	4,084 sq. ft.
Superheating	993 sq. ft.
Comb. evaporative and superheating	5,077 sq. ft.
Tender:	
Water capacity	9,000 gal.
Fuel	16 ton
General data, estimated:	
Rated tractive force, 85 per cent	68,850 lb.
Cylinder horsepower (Cole) (est.)	2,624 hp.
Weight proportions:	
Weight on drivers ÷ tractive force	4.26
Total weight engine ÷ cylinder hp.	111.5
Boiler proportions:	
Comb. heating surface ÷ cylinder hp.	1.93
Tractive force ÷ comb. heating surface	13.57
Tractive force × diam. drivers ÷ comb. heating surface	732.5
Cylinder hp. ÷ grate area	37.18

General News Department

The New England Railroad Club at its annual meeting on March 9, chose for the ensuing year, as president, F. J. Carty, mechanical engineer of the Boston & Albany; and for vice-president, F. C. Shepherd, chief construction engineer of the Boston & Maine.

The Interstate Commerce Commission has authorized the Chicago, Milwaukee & St. Paul to install an automatic train-stop or train-control device upon that portion of its line between Perry, Iowa, and Manilla, Iowa, in lieu of the territory specified in the order of January 14, 1924.

The New York syndicate which will back the construction of the Rouyn branch of the Canadian National is composed of Dillon, Reed & Company, and White, Weld & Company, according to a statement in the House of Commons at Ottawa this week by James A. Robb, Minister of Finance, in answer to questions by Sir Henry Drayton, a prominent Conservative member.

The semi-annual interest on the $3,000,000 5 per cent bonds of the Chicago, Milwaukee & Gary, due April 1, will be paid, according to a ruling handed down by Federal Judge Wilkerson in the United States District Court at Chicago, on March 15. The bondholders' committee filed a petition asking that the interest payment be withheld on the ground that the road is not profitable. Judge Wilkerson set April 8 as the date for a hearing on the foreclosure suit of the Chicago, Milwaukee & St. Paul, filed by the Guarantee Trust Company of New York.

Executives at Odds on Watson-Parker Bill

The Association of Railway Executives met in New York City on Wednesday, March 17, to take action on the Watson-Parker bill, now before Congress, to abolish the Railroad Labor Board and in its place provide for direct action by the railroads and their employees; but the principal outcome of the meeting was the decided opposition of 19 roads, the representatives of which left the meeting, and resolved that each should notify the secretary of the association of their decision not to endorse the report of the committee favoring the proposed legislation. This report was adopted by the majority (43 roads), in spite of strenuous opposition by L. F. Loree (D. & H.) and others.

The bill, known as the Railway Labor Act, has been passed by the lower House of Congress and has been favorably reported from the committee in the Senate. It has been opposed by various shippers' associations and others, as well as by the 19 railroads. The bill as it now stands does not include the paragraph providing for advancing freight or passenger rates subsequent to and in consequence of an advance in employees' wages.

Mr. Loree and those acting with him proposed a modification to authorize the Interstate Commerce Commission to suspend the operation of any agreement between railways and their employees, made under the proposed new law, if the commission should be of opinion that the intended change in wages should necessitate readjustment of the transportation rates of any carrier. This proposal has been endorsed by the American Farm Bureau.

Being defeated in this proposal the minority took their dissenting action, as above noted. Among those acting with Mr. Loree were E. N. Brown (St. L-S. F.); W. H. Williams (Wabash); Frank G. Alfred (P. M.); C. E. Schaff (M.-K.-T.); D. Upthegrove (St. L. S. W.), and J. E. Gorman (R. I.).

Other roads joining in this action were: The Ann Arbor, the Bangor & Aroostook, the Chicago & Alton, the Denver & Rio Grande Western, the Denver & Salt Lake, the Erie, the Kansas City Southern, the Maine Central, the Minneapolis & St. Louis, the Rio Grande Southern, the Texas & Pacific and the Virginian.

Signal Section, September 7

The next meeting of the Signal Section of the American Railway Association at Hotel Ambassador, Los Angeles, Cal., is to be held on Tuesday, Wednesday and Thursday, September 7, 8 and 9, instead of on Wednesday, Thursday and Friday as heretofore announced.

OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM ROADS IN THE UNITED STATES

(For 188 Steam Roads, Including 13 Switching and Terminal Companies)

For the Month of January, 1926 and 1925

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925
Average number of miles operated	236,939.57	236,788.56	59,328.11	59,564.62	5,535.58	5,531.88	38,699.97	38,481.12	133,375.91	133,210.94
Revenues:										
Freight	$347,568,096	$350,765,502	$150,032,468	$154,490,640	$19,125,169	$17,373,711	$52,583,756	$48,622,677	$125,826,703	$130,278,474
Passenger	a 89,504,745	c 88,739,030	42,269,616	42,472,631	1,970,473	2,015,425	16,216,249	14,264,076	29,048,407	29,986,898
Mail	8,013,354	8,111,132	2,976,488	3,099,062	216,531	217,131	1,212,824	1,165,236	3,607,511	3,629,703
Express	9,810,567	10,773,004	4,541,907	5,112,574	217,877	296,519	1,533,073	1,476,815	3,517,710	3,887,096
All other transportation	15,447,722	15,850,661	8,708,539	8,832,687	186,779	181,011	959,060	903,201	5,593,344	5,933,762
Incidental	9,973,077	10,006,397	5,002,767	5,012,469	352,495	335,548	1,535,708	1,383,127	3,082,107	3,275,253
Joint facility—Cr.	1,081,782	994,489	423,751	487,496	13,586	15,217	142,522	124,514	501,923	367,262
Joint facility—Dr.	403,885	221,536	137,369	107,523	2,104	1,958	34,219	29,796	230,193	82,259
Ry. operating revenues	480,995,458	485,018,679	213,818,167	219,400,036	22,080,806	20,432,604	74,148,973	67,909,850	170,947,512	177,276,189
Expenses:										
Maintenance of way and structures	58,783,090	56,967,451	25,583,151	25,380,486	2,838,702	2,535,137	9,770,486	9,116,283	20,590,751	19,935,545
Maintenance of equipment	105,442,865	108,457,911	50,205,102	52,367,452	4,814,228	4,936,954	13,954,793	13,629,760	36,468,742	37,523,745
Traffic	9,012,221	8,500,912	3,268,615	3,106,708	240,653	222,712	1,718,515	1,547,650	3,784,438	3,623,842
Transportation	186,742,899	191,886,193	87,166,693	89,724,445	6,582,276	6,295,267	27,138,356	25,294,514	65,855,574	70,571,967
Miscellaneous operations	4,575,070	4,353,402	2,133,640	2,164,470	97,152	87,409	691,126	548,728	1,653,152	1,552,795
General	15,164,020	14,446,036	6,915,518	6,422,179	468,819	471,836	1,950,618	1,861,582	5,829,065	5,690,439
Transportation for investment—Cr.	1,071,451	649,926	166,055	95,359	32,999	20,983	282,209	142,455	590,188	391,129
Ry. operating expenses	378,648,714	383,961,979	175,106,664	179,070,381	15,008,831	14,528,332	54,941,685	51,856,062	133,591,534	138,507,204
Net revenue from railway operations	102,346,744	101,056,700	38,711,503	40,329,655	7,071,975	5,904,272	19,207,288	16,053,788	37,355,978	38,768,985
Railway tax accruals	28,524,547	27,207,055	10,873,990	10,517,808	1,519,346	1,234,014	4,377,940	3,745,017	11,753,271	11,710,216
Uncollectible ry. revenues	110,705	144,944	50,625	77,400	2,993	3,636	11,017	13,801	46,070	50,107
Ry. operating income	73,711,492	73,704,701	27,786,888	29,734,447	5,549,636	4,666,622	14,818,331	12,294,970	25,556,637	27,008,662
Equipment rents—Dr. bal.	5,961,591	5,974,063	2,795,706	3,008,688	d 572,588	d 517,327	1,845,458	695,736	1,893,015	2,786,966
Joint facility rent—Dr. bal.	2,025,341	1,670,461	813,900	730,028	105,340	93,227	103,823	147,612	1,002,278	699,594
Net ry. operating income	65,724,560	66,060,177	24,177,282	25,995,731	6,016,884	5,090,722	12,869,050	11,451,622	22,661,344	23,522,102
Ratio of expenses to revenues (per cent)	78.72	79.16	81.90	81.62	67.97	71.10	74.10	76.36	78.15	78.13

a Includes $3,393,863 sleeping and parlor car surcharge. c Includes $2,978,440 sleeping and parlor car surcharge. d Deficit or other reverse items.
Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Traffic News

The Akron (Ohio) Traffic Club will hold its next meeting on Tuesday evening, March 23, at the Masonic Temple, Barberton, Ohio.

Hearings on the application for changes in freight rates on southwestern cotton to Gulf ports before the Interstate Commerce Commission have been postponed from March 17 to April 20 upon the request of the maritime committee of the Houston Cotton Exchange.

The Atchison, Topeka & Santa Fe will open its Indian detour on May 15. Westbound passengers will leave the transcontinental trains at Las Vegas, N. M., and travel in motor buses through the Indian and desert country to Albuquerque. The trip covers 270 miles.

Proposed increases in freight rates from St. Louis, Mo., to Kansas City and St. Joseph, which the roads in north Missouri attempted to put into effect last June, have been ordered cancelled by the State Public Service Commission on the ground that the increase is not justified.

The Shippers' Conference of Greater New York, in which are represented some 200 industries, held its annual meeting and dinner at the rooms of the New York Traffc Club, in the Waldorf-Astoria Hotel, on the evening of March 9. W. A. Moore, of the New Jersey Zinc Company, was elected chairman for the ensuing year and P. W. Moore, secretary.

As a step in meeting the competition of motor truck freight carriers, the Missouri-Kansas-Texas has issued a circular to draymen at all points along its lines, suggesting means of increasing their business and handling more freight with their present equipment. The transfer men are advised to co-operate with local agents of the Katy for their mutual benefit and protection.

Embargoes of freight consigned to nine retail coal dealers in Brooklyn and vicinity have been issued by the Long Island Railroad because of clogging of tracks due to the ending of the anthracite strike. Dealers to whom were consigned several hundred cars of bituminous coal, which arrived after the announcement of the end of the strike, refused to take the cars. On March 8, the embargo was withdrawn as to two of the concerns named.

Negotiations are now under way between the Pacific Great Eastern and the Board of Harbor Commissioners for running rights over the Harbor Board terminal railway to Vancouver, B. C. Under the proposed agreement trains will be able to cross the bridge into Vancouver under their own power and from there will be moved on south shore railway tracks by Harbor Board switching engines, the Harbor Board having running rights on certain sections of railways on the south shore.

The Chicago, Milwaukee & St. Paul is now operating its Southwest Limited as a through train between Milwaukee, Wis., and Kansas City, Mo., carrying sleeping cars from Chicago. This train formerly ran between Chicago and Kansas City. Under the new arrangement the train leaves Milwaukee at 5 p. m., connects at Davenport, Ia., at 11:05 p. m. with cars leaving Chicago at 6 p. m. and arrives in Kansas City at 8 a. m. Returning, the train leaves Kansas City at 6 p. m., arriving in Milwaukee at 9:15 a. m.

The "Pine Tree Limited" of the Boston & Maine, the through fast express put on between Boston and Portland last autumn, averaged 177 passengers per trip in each direction, in January, and 187 in December. On the day before Christmas, the number of passengers eastbound was 961, requiring a second section of the train. Since this train was put on, the sale of tickets between Boston and Portland has increased about 9 per cent while, on the Portland division as a whole, and on the entire Boston & Maine system, the passenger traffic has continued to fall off. From this it is concluded that the new train has stimulated traffic; but just how many of its passengers were diverted from other trains has not been precisely determined.

The indictment against the Chicago, St. Paul, Minneapolis & Omaha charging violation of the long and short haul statute, was dismissed by the county district court at Minneapolis, Minn., on March 8. The decision was based on a previous ruling of the same court in the suit against the Northern Pacific charging violation of the Cashman rate act. The Minnesota courts are without power to act in conflict with the authority of the Interstate Commerce Commission to fix intrastate freight rates where they conflict with interstate rates.

The Great Northern is planning to extend its chain of hotels in the Glacier National Park to embrace the Canadian territory north of the boundary and will construct a hotel capable of accommodating 450 guests, in Waterton Park, Alta. The building will be made of logs, will be of the Swiss chalet type, and will seat 500 in its dining room. It will be 70 miles from the Great Northern's tracks and ten miles north of the boundary line at the southern end of Waterton Lake. The building will be erected by the Glacier Park Hotel Company, a subsidiary of the railroad company. It is estimated to cost $1,000,000

The Southern Railway announces that, beginning with May 1, a new solid, all-Pullman train will be run between Cincinnati and New Orleans with sleeping cars to and from Detroit, Mich., and Cleveland, Ohio, over the New York Central Lines. The new train is to be called the Queen & Crescent Limited, and the time between Cincinnati and New Orleans, 836 miles, will be 22 hrs., 20 minutes or two hours, 10 minutes less than the best time under the present time table. When this train is put in service, trains 41 and 42 between New York and New Orleans will be run independent of connections at Chattanooga from Cincinnati.

The Alton Transportation Company, bus operating subsidiary of the Chicago & Alton, has announced a schedule of two round trips daily for the two motor buses it plans to place in operation between Jacksonville, Ill., and St. Louis, Mo. Buses will leave Jacksonville for St. Louis at 10:30 a. m. and 3:15 p. m., and will leave St. Louis for Jacksonville at 11 a. m. and 3 p. m., the trip each way being completed in three hours. Additional bus service will be provided between Jacksonville and Alton and between St. Louis and Alton. Connections will be made with trains at Alton and Roodhouse. Application has already been made to the Illinois Commerce Commission for permission to operate these buses. The commission recently granted a certificate to the Alton Transportation Company to operate motor buses between Joliet and Springfield. This is in accordance with the plans of the Chicago & Alton for the operation of motor buses as reported in the *Railway Age* of February 27.

Western Roads Seek to Prepare Way for Bus Operation

An application to secure authority for the publication of joint through passenger fares covering transportation partly by rail and partly by motor bus has been placed before the Interstate Commerce Commission by eight large western roads. These roads are the Union Pacific, the Oregon Short Line and the Oregon-Washington Railroad & Navigation Company, which were joined in filing the petition by the Chicago & North Western, the Denver & Rio Grande Western, the Northern Pacific, the Southern Pacific, and the Western Pacific. The petitioners declare that the publication of joint through passenger fares covering transportation partly by rail and partly by bus cannot be accomplished at the present time under the restrictions of Rule 34 (H) of Interstate Commerce Commission tariff circular No. 18-A. It is further declared that through transportation partly by rail and partly by bus is not feasible, nor can a proper correlation of the two services be effected unless some way is provided for the convenient publication of through fares covering the combined service. The commission is asked to determine whether or not it has jurisdiction over motor bus service performed by railways in their own name or through subsidiary companies in conjunction with their rail service, and if such service is not subject to the jurisdiction of the commission, to modify the rule cited in order to permit the desired publication of through fares covering combined rail and motor bus service. The commission has not yet set a date for a hearing on this petition.

Commission and Court News

Interstate Commerce Commission

Petitions asking the Interstate Commerce Commission to make permanent the temporary rates now in effect on bituminous coal from the southern West Virginia fields to the northeastern states, which expire by limitation on April 30, have been filed with the commission by the New England Governors' Fuel Committee, the Kanawha Coal Operators' Association and a large number of New England commercial organizations. The rates were put into effect by order of the commission on the theory that an emergency existed during the anthracite strike. The railroads involved have also filed answers opposing the petitions.

Examiner Recommends Finding Against Proposed Increase in Salt Rates

A recommendation that the Interstate Commerce Commission find proposed increases in the freight rates on salt in carloads from New York points to eastern New England and Canadian points is made in a proposed report by Attorney-Examiner F. C. Hillyer, of the commission, made public on March 17. The examiner also recommended an order by the commission cancelling the proposed rates, which had been suspended, but that changes proposed by the railroads in the uniform carload minimum and description governing commodity rates on common salt shipped interstate from producing points in the state of New York to destinations in trunk line, New England and western territories and Canada, be found justified and their future maintenance required. Mr. Hillyer also recommended a finding that commodity rates on salt in carloads, to be governed by the proposed uniform minimum and description, from New York producing points to destinations in trunk line and New England territories, will be unreasonable, with some exceptions; that reasonable rates be prescribed for the future; and that commodity rates on salt from producing points in Michigan and Ohio to points in trunk line and New England territories be found unreasonable, and that reasonable rates be prescribed for the future in relation to the rates from New York to the same destinations.

Personnel of Commissions

Consideration in the Senate of the confirmation of the appointment of Thomas F. Woodlock as a member of the Interstate Commerce Commission, which had been set for March 16, was again postponed until March 18, and then postponed again because of the absence of a number of Senators from Washington this week.

United States Supreme Court

Charges for Troop Transportation Prior to Federal Control

The Supreme Court of the United States has affirmed the judgments of the Court of Claims allowing the claims of certain railroads for charges for transportation of troops and military impedimenta by these companies and their connecting carriers prior to federal control of railroads. The court holds that the transportation for which these claims were made did not grow out of federal control, and was not as contended by the Government, included in the settlements wherein the companies acknowledged that the Director General had returned to them all their property and rights and had satisfied all obligations on his part or on the part of the United States or the Railroad Administration "growing out of federal control." The railroads making the claims were the Reading, the Southern, the St. Louis, Brownsville & Mexico, the New Haven, the Central New England, the B. & O. and the Pere Marquette.—United States v. Reading. Decided March 1, 1926. Opinion by Mr. Justice Butler.

Jurisdiction of Federal District Court Denied Where Neither Party Was Resident of District

The Supreme Court of the United States has affirmed the judgment of the federal district court for eastern Missouri in the action by the Seaboard Rice Milling Company against the Rock Island for damages alleged to have been sustained in the interstate transportation of rice shipped from Arkansas to New York. The federal court dismissed the case for want of jurisdiction, neither the railroad company nor the Milling Company being a resident or inhabitant of the district. The Milling Company is organized under the laws of Texas; the railroad company is organized under the laws of Illinois and Iowa, having its principal office in Chicago, but maintaining a branch office and operating a branch line within the eastern district of Missouri. The Supreme Court holds that a corporation within the meaning of the jurisdictional statutes, is a resident of the state in which it is incorporated, and not a resident or inhabitant of any other state, although it may be engaged in business within such other state.—Seaboard Rice Milling Co. v. Chicago, Rock Island & Pacific. Decided March 1, 1926. Opinion by Mr. Justice Sanford.

State Quarantine Against Alfalfa Held Invalid

The Supreme Court of the United States has reversed the decree of the Supreme Court of Washington which affirmed the decree of the Superior Court enjoining violation of the state quarantine regulation of September 17, 1921, declaring a quarantine against certain areas in Idaho, Utah, Wyoming, Oregon, Nevada and Colorado and forbidding the importation into Washington of alfalfa hay and alfalfa meal, except in sealed containers, on account of the alfalfa weevil. The order was made pursuant to Laws of 1921, c. 105, p. 308.

The Court says that pending legislation by Congress as to quarantine of diseased trees and plants in interstate commerce, the statute of Washington on the subject cannot be given application. According to the federal statute the Act of Congress August 20, 1912, as amended March 4, 1917 the obligation to act without respect to the states is put directly upon the Secretary of Agriculture, whenever quarantine, in his judgment, is necessary. When he does not act, it must be presumed that it is not necessary. With the federal law in force, state action is illegal and unwarranted.—O.-W., R. & N. Co. v. State of Washington. Decided March 1, 1926. Opinion by Mr. Chief Justice Taft. Justices McReynolds and Sutherland dissented.

Contract for Use of Engine for Spotting Service Held Invalid

The Chesapeake & Ohio and the Director General sued contractors for construction work for the Government on premises at Newport News connected by industrial tracks with the railroad's main line, for services of an engine and crew rented or assigned under a contract made in September, 1917, when, owing to war conditions, there was serious congestion and the railroad failed duly to perform spotting service. The railroad sued for the period prior to December 28, 1917; the Director General for that later. Judgments for defendant were affirmed by the Virginia Supreme Court of Appeals on the ground of want of consideration. These judgments have been affirmed by the Supreme Court of the United States.

The Court says in substance that the service of spotting cars was included in the line haul charge under both interstate and state tariffs; that the carrier was here seeking compensation in excess of the tariff rate for having performed a service covered by the tariff, which is expressly prohibited by the Interstate Commerce Act, §6 (7) as amended, and that a contract to pay this additional amount is both without consideration and illegal. It was held to be no answer that by virtue of the contract the shipper secured the assurance of due performance of a transportation service which otherwise might not have been promptly rendered; that ordinarily rental of engine and crew is not a common carrier service; and that such rental may be charged without filing a tariff providing therefor. To so assure performance to a shipper was held an undue preference; hence the contract would be equally void for illegality on this ground.—Chesapeake & Ohio v. Westinghouse, Church, Kerr & Co. Decided March 1, 1926. Opinion by Mr. Justice Brandeis.

Compensation for Use of Short Line Railroad During Federal Control Refused

The Supreme Court of the United States has affirmed judgment of the Court of Claims for the United States (60 Ct. Cl. 230) in the Marion & Rye Valley's suit for $14,425.94 as compensation for the alleged taking possession and use by the United States of its short line railroad between December 28, 1917, and June 29, 1918. The court said, in part: "We have no occasion to determine whether in law the President took possession and assumed control of the railway. For even if there was technically a taking, the judgment for defendant was right. Nothing was recoverable as just compensation, because nothing of value was taken from the company; and it was not subjected by the government to pecuniary loss. Nominal damages are not recoverable in the Court of Claims."

This was a test case representing circumstances typical of a number of "short lines," and was taken to the Court of Claims after the director general of railroads had refused to pay the amount of award made by a board of referees appointed by the Interstate Commerce Commission. In the course of the decision the court says:

"Some general notices or orders issued by the director general were received by the Marion & Rye Valley shortly after the issue of the proclamation, but no order dealing specifically with that railroad was given by him. He did not at any time take over the actual possession or operation of the railroad; did not at any time give any specific direction as to its management or operation; and did not at any time interfere in any way with its conduct or activities. The railroad was operated during the period exactly as it had been before, without change in the manner, method or purpose of operation. The railroad did not serve any military camp; nor did it transport troops or munitions. The character of the traffic remained the same.

"Nothing appears to have been done by the director general which could have affected the volume or profitableness of the traffic or have increased the requirements for maintenance or depreciation; and apparently it retained its earnings; expended the same as it saw fit; and, without accounting to the government, devoted the net operating income to the company's use.

"The company urges that the claim sought to be enforced rests upon a statutory right to the just compensation specifically defined in the federal control act; that the compensation there prescribed is for the rental value at the rate of the average annual railway operating income for the three years ended June 30, 1917; that by the taking, although technical, the government agreed to pay the compensation defined in the statute; that the function of the board of referees, acting under the statute, was to find that sum 'as nearly as may be,' and that by its report it had done so.

"Congress did not, however, direct the President to make such payment. It merely authorized him to agree with any carrier of whose railroad he took possession and control that it should 'receive just compensation.' * * * The provision did not establish a rule of compensation. The President was not permitted to agree to pay more, but he was left free to refuse to pay that sum. The carrier was left free to reject any offer that might be made. * * * The fact that the right to recover compensation is a statutory one, did not relieve the railroad from the burden of proving the value of the use taken. The board simply adopted as its measure the so-called 'standard return' of the federal control act. No evidence was introduced before it to show that the alleged taking had subjected the company to any pecuniary loss or had deprived it of anything of pecuniary value, although the hearing before the board was commenced long after the period of alleged possession and control had expired. The report was, therefore, without evidential value.

"The opinion of the Court of Claims discloses that the company claimed there that, if it was not entitled to recover under the federal control act, it was entitled to recover under § 204 of Transportation Act, 1920. This contention, overruled below, was not renewed here."—Marion & Rye Valley vs. U. S. Decided March 1. Opinion by Mr. Justice Brandeis.

This road extends from Marion, Smyth County, Virginia, on the Norfolk & Western, southeastward, 18 miles, to Sugar Grove.

During 1925 the Atchison, Topeka & Santa Fe handled 2,750,000 pieces of baggage on which it paid claims amounting to only $4,086.

Equipment and Supplies

Locomotives

The Long Island is having 7 a.c. switching electric locomotives built in the Altoona shops of the Pennsylvania Railroad. This equipment is to be used on the Long Island's Bay Ridge line in Brooklyn.

Freight Cars

The East Broad Top Railroad & Coal Company is inquiring for 25 narrow gage hopper cars of 35 tons' capacity.

The Missouri Pacific has ordered 600 box car bodies from the Pennsylvania Car Company. Inquiry for this equipment was reported in the *Railway Age* of January 9.

The Colorado & Southern has ordered 100 ballast cars from the Rodger Ballast Car Company. Inquiry for this equipment was reported in the *Railway Age* of February 20.

The Central of New Jersey is inquiring for 100 gondola cars of 70 tons' capacity. This company is also inquiring for 1,000 box cars, as was reported in the *Railway Age* of March 13.

The Illinois Central has ordered 200 automobile furniture cars from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of February 20.

The Southern Railway's order for freight cars included 1,500 box cars instead of 1,000 let to the Mt. Vernon Car Manufacturing Company, as was reported in the *Railway Age* of March 13. The railroad company is also having 2,100 gondola coal cars rebuilt and 100 caboose cars built, and in its own shops is building 500 flat cars. An order was recently given to the Virginia Bridge & Iron Company for 1,000 steel underframes to be applied to box cars in the Southern Railway's shops.

Passenger Cars

The Southern Railway is building in its own shops 25 refrigerator cars for passenger service.

The Cleveland, Cincinnati, Chicago & St. Louis has ordered one combination mail and baggage gas-electric car from The J. G. Brill Company.

The New York, Westchester & Boston has ordered 10 motor passenger cars from the Pressed Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of February 27.

The National Railways of Mexico are inquiring through the car builders for from 5 to 20 cars of each of the following types: First-class passenger cars, second-class passenger cars, first and second-class passenger cars and steel baggage cars.

The Richmond, Fredericksburg & Potomac has ordered 6 express cars from the American Car & Foundry Company, and 4 coaches from the Bethlehem Shipbuilding Corporation. Inquiry for this equipment was reported in the *Railway Age* of February 27.

The Illinois Central has ordered three dining cars and six coaches from the Pullman Car & Manufacturing Corporation and five baggage cars from the American Car & Foundry Company. Inquiry for this equipment, reported in the *Railway Age* of March 6, included five club baggage cars which will be purchased later.

Motor Vehicles

The Boston & Maine Transportation Company, which was noted in the *Railway Age* of March 13 as contemplating the purchase of 25 motor buses, has ordered from the Yellow Manufac-

turing Sales Corporation through the National Railway Appliance Company 16 buses as follows: 8 type Y parlor coaches, 5 type Y chassis, and 3 type X (21-passenger) city type coaches.

Iron and Steel

THE MISSOURI PACIFIC is inquiring for 600 tons of structural steel.

THE LEHIGH VALLEY has placed an order for 200 tons of bridge steel.

THE NEW YORK CENTRAL is inquiring for 3,500 tons of steel for three bridges.

THE WESTERN MARYLAND is inquiring for 900 tons of steel for a bridge in West Virginia.

THE LOUISVILLE & NASHVILLE is inquiring for 2,700 tons of structural steel for bridges.

Machinery and Tools

THE CENTRAL OF GEORGIA has ordered a Dill slotter from Manning, Maxwell & Moore, Inc.

THE BALTIMORE & OHIO has ordered a double spindle rod boring machine from Baker Brothers, Inc.

THE MISSOURI PACIFIC has ordered a 1,500-lb. steam hammer from the Niles-Bement-Pond Company.

THE CENTRAL OF GEORGIA has ordered a 58-in. by 16-ft. rod mill from the Niles-Bement-Pond Company.

THE ILLINOIS STEEL COMPANY has ordered a 72-in. by 37-ft. lathe from the Niles-Bement-Pond Company.

THE QUANAH, ACME & PACIFIC has ordered a 36-in. by 14-ft. engine lathe from Manning, Maxwell & Moore, Inc.

THE MISSOURI PACIFIC has ordered a 36-in. by 36-in. by 42-in. crank planer from Manning, Maxwell & Moore, Inc.

THE CHESAPEAKE & OHIO has ordered a 90-in. locomotive journal lathe from Manning, Maxwell & Moore, Inc.

THE AMERICAN CAR & FOUNDRY COMPANY has ordered a special multiple punch from the Niles-Bement-Pond Company.

THE OSGOOD-BRADLEY CAR COMPANY has ordered two Bignall-Keeler pipe machines from Manning, Maxwell & Moore, Inc.

THE AMERICAN BRAKE SHOE & FOUNDRY COMPANY has ordered two Rockford Rigidmills from Manning, Maxwell & Moore, Inc.

THE READING COMPANY has ordered a single spindle vertical boring and drilling, heavy duty machine from Baker Brothers, Inc.

THE PENNSYLVANIA RAILROAD has ordered a combination journal turning and axle lathe from the Niles-Bement-Pond Company.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered one engine lathe, one boring mill and one turning and boring mill from Manning, Maxwell & Moore, Inc.

Signaling

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered from the Union Switch & Signal Company nine "S-8" electro-mechanical units and a 12-lever mechanical section for adding to the 40-lever mechanical interlocking machine at "MC" Junction, Middletown, Ohio, also for Lippincotts, Ohio, a 20-lever mechanical frame and 6 electric lever units will be installed.

THE BOSTON & MAINE has placed orders with the Union Switch & Signal Company for the necessary materials for the installation of the Union continuous inductive automatic train control system on the Fitchburg division between Boston and Greenfield, 100 miles, double track. This system will be operated over direct current track circuited territory, where the present automatic block signaling system utilizes polarized d.c. track circuits for control. The order includes equipment for 133 locomotives.

Supply Trade News

Battey & Kipp, Inc., on April 1 will remove its office to 231 South LaSalle street, Chicago.

The general offices of the **Commonwealth Steel Company** are now in the new office building at its plant in Granite City, Ill.

C. S. Carter has been appointed sales representative of the **Locomotive Firebox Company,** Chicago, with headquarters at Minneapolis, Minn.

The Central Steel Company, Massillon, Ohio, has opened a district sales office at 404 West First street, Tulsa, Okla., in charge of **L. S. Allen.**

Weir H. Traver has been appointed sales representative of the **Consumers Company,** Chicago, and will specialize in railroad building material sales.

The Colorado Fuel & Iron Company has awarded a contract to the **Morgan Engineering Company,** Alliance, Ohio, for the installation of a structural steel mill at Pueblo, Colo.

Carl Abell has been appointed advertising manager of the **American Car & Foundry Motors Company,** operating the **Fageol Company,** with headquarters at 165 Broadway, New York.

M. H. Gersking, sales representative of the **Carnegie Steel Company,** with headquarters at Columbus, Ohio, has been appointed assistant district sales manager, with headquarters at Cincinnati, Ohio.

Directors of the **American Locomotive Company** have called a special meeting of the stockholders for April 20 to approve the terms of the proposed merger with the Railway Steel Spring Company.

William A. Edwards, branch manager of the Chicago territory for the **Ludlum Steel Company,** Watervliet, N. Y., has been transferred to take charge of the southwestern territory, with headquarters at Houston, Texas.

H. B. Pflasterer, formerly sales representative of the Hazard Manufacturing Company, with headquarters in Chicago, has been appointed railroad sales engineer of **S. F. Bowser & Co., Inc.,** Ft. Wayne, Ind., with headquarters in Chicago.

The Interstate Car & Foundry Company, Indianapolis, Ind., formerly the Interstate Car Company, has been organized by **G. J. Diver,** manager of the Interstate Car Company, who will be president, and **L. R. Meyer,** also connected with the Interstate Car Company, who will be vice-president and secretary. The new company will manufacture grey iron and semi-steel castings.

Obituary

Ausborn F. Old, eastern sales manager, at New York, of the Hale-Kilburn Company, Philadelphia, Pa., died after a brief illness of pneumonia at the Fifth Avenue hospital in New York City, on March 16, at the age of 80. Mr. Old had been with this company for the past 35 years serving in its sales organization.

Trade Publications

AIR LIFTS FOR WATER SUPPLIES.—In a 16-page bulletin No. 129, the Sullivan Machinery Company, Chicago, presents an interesting account of the use of air lifts for the delivery of water from deep wells. The advantages of pneumatic pumping are outlined in detail and a number of railway installations of Sullivan equipment are illustrated and described.

Railway Construction

CAMAS PRAIRIE.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from Joseph to Stites, Idaho, 66 miles, proposing to operate also over a line to be built by the Northern Pacific from Joseph to Orofino, 32 miles.

CHICAGO, BURLINGTON & QUINCY.—Plans are being prepared for the rearrangement of tracks and the construction of an addition to the roundhouse at Gibson, Neb., to cost $40,000.

CHICAGO, NORTH SHORE & MILWAUKEE.—A contract has been awarded to the Libertyville Construction Company, Libertyville, Ill., for the construction of a one-story passenger station 34 ft. by 96 ft., at Mundelein, Ill., to cost $50,000.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from a point near Trenton, Mo., to a connection with the Chicago, Milwaukee & St. Paul near Braymer, Mo., 33.65 miles.

DELAWARE, LACKAWANNA & WESTERN.—This company will build a modern concrete coaling station at East Buffalo, N. Y., with a capacity of 1,000 tons of coal, and sand storage house for locomotive sand, with a capacity of 1,000 tons of wet sand, all to be in one structure—a combined sand and coaling station. This company will also build a new turntable 105 ft. long, at East Buffalo, N. Y.

GREAT NORTHERN.—A contract has been awarded to F. J. Siverson, Minneapolis, Minn., for the construction of a one-story brick and concrete addition to a freight house at Minneapolis. The addition will have dimensions of 32 ft. by 125 ft.

ILLINOIS CENTRAL.—Plans are being prepared for the construction of a passenger station at Ackley, Ia.

MAINE CENTRAL.—This company has authorized the construction of a coaling plant, a 7-stall enginehouse, a turntable and a storehouse and the rearrangement of tracks at Lewiston, Me.; estimated cost. $113,000. Coaling plants with rearrangements of sidings, to cost $56,000 and $81,000 respectively have been authorized for Rumford and Bangor. Bids on the coaling plants only were closed on March 13.

NEW YORK, CHICAGO & ST. LOUIS.—Plans are being prepared for the construction of a machine shop and blacksmith shop at Frankfort, Ind., to replace structures destroyed by fire on March 9 with a loss estimated at $500,000.

SAN ANTONIO & ARANSAS PASS.—The Interstate Commerce Commission has made public a report proposed by Commissioner Woodlock recommending a finding by the commission that public convenience and necessity has not been shown to require the construction by the San Antonio & Aransas Pass of an extension from Falfurrias, Tex., to a crossing of the Rio Grande river, about 84 miles, and a line from Edinburg to Harlingen, Tex., 30 miles, to be operated by the Southern Pacific. The report said:

"Careful examination of the entire record leads irresistibly to the conclusion that the (lower Rio Grande) Valley is at present efficiently and adequately served by the Missouri Pacific system,' that that system is capable of handling a much heavier volume of movement from the Valley, and that it is looking ahead and taking steps to have its service grow and improve, so as to adequately meet the needs of the Valley as they develop. In this state of facts we should conclude that for the present, and at least the immediate future, the entry of another railroad into the Valley not only is not required, but, viewed in the light of broad public interest, would be more apt to prove detrimental than otherwise. It follows that the proposed construction in the Valley should not be permitted, and, as above indicated, the remainder of the project is contingent upon the entry into the Valley. These conclusions are, of course, based upon the showing in this record, and should be made without prejudice to a renewal of the application if and when changed conditions appear to warrant it." Arguments on the two applications will be heard by the Commission on May 7.

TEXAS & PACIFIC.—Plans have been prepared for the construction of a freight warehouse and office building at Dallas, Tex., to cost $1,500,000.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—*Guaranty.*—The Interstate Commerce Commission on March 16 issued a certificate to the Secretary of the Treasury certifying the amounts necessary to make good to the Atchison, Topeka & Santa Fe and other companies comprising the system, the amount guaranteed to the railways for the six months' period following the termination of federal control in 1920, under section 209 of the transportation act. The commission finds that the amount due the Atchison, Topeka & Santa Fe was $4,139,744; to the Gulf, Colorado & Santa Fe, $2,586,073; to the Panhandle & Santa Fe, $814,038; to the Grand Canyon Railway, $5,487; and to the Rio Grande, El Paso & Santa Fe, $49,621. There had previously been paid in partial payments $5,425,000 to the Atchison, Topeka & Santa Fe, $1,575,000 to the Gulf, Colorado & Santa Fe, $550,000 to the Panhandle & Santa Fe, $9,500 to the Grand Canyon and $40,000 to the Rio Grande, El Paso & Santa Fe, the overpayment to the Santa Fe being approximately balanced by the underpayments to the others.

BALTIMORE & OHIO.—*Acquisition of C. I. & W.*—The application filed with the Interstate Commerce Commission for authority to acquire control of the Cincinnati, Indianapolis & Western through the purchase of not less than 80 per cent of its capital stock, and to operate the property, states that the application is believed to be in the public interest because: "It will permit the Baltimore & Ohio to extend its services over the line between Hamilton, Ohio, and Indianapolis, Ind., to Decatur and Springfield, Ill., placing these important railroad and industrial centers in direct touch, by a single railroad system, with the many other important points reached directly by the Baltimore & Ohio, and affording additional connections, other than through Chicago and St. Louis, with several trans-Mississippi systems." It is estimated that there may be savings of $100,000 to $150,000 in organization and traffic expenses per annum, but that they may be offset by a somewhat higher standard of maintenance and operation. The Cincinnati, Indianapolis & Western line extends from Hamilton, Ohio, to Springfield, Ill., 283.2 miles, with a branch from West Melcher to Brazil, Ind., 25.43 miles. The Baltimore & Ohio has agreed to purchase 97,103 shares, or 90.75 per cent of a total issue of 107,000 shares, at $24.50 per share for preferred stock and $14.50 per share for common stock, and the total purchase price, if all the stock is purchased and the outstanding liabilities are assumed is estimated at $7,273,071.

BOSTON & MAINE.—1925 *Earnings.*—The annual report made public on Monday shows net income after interest and other charges of $5,468,999, an increase of $3,361,170 over 1924. An abstract of the data shown in the annual report will appear in next week's issue of the *Railway Age.*

BLOOMSBURG & SULLIVAN.—*Abandonment.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon that part of its line from Benton, Pa., to Jamison City, 9 miles. The road has a total mileage of 29 and the portion authorized to be abandoned serves lumber operations since abandoned.

BUFFALO & SUSQUEHANNA.—*Dividends Passed.*—Directors of the Buffalo & Susquehanna on February 26 passed the regular quarterly dividend on the common stock usually payable on March 31. On December 30 a dividend of 75 cents was paid, prior to which time the company had been paying regular dividends at the annual rate of 7 per cent since 1917. In 1922 and 1923 the company declared extra dividends of 10 per cent and in 1924 stockholders received extra dividends of 2½ per cent.

CHESAPEAKE & OHIO.—*Dividends Increased.*—The directors, at a meeting in Cleveland, Ohio, on March 17, declared a special dividend of $4 and a dividend of $2 on the common stock for the first quarter of 1926, both payable April 15 to stock of record April 1. The regular semi-annual dividend of $3.25 was also declared on the preferred stock, payable July 1 to stock of record June 8. The previous rate on the common stock was $4 annually. The Hocking Valley declared a special dividend of $4 and the

regular dividend of $2, payable April 30 to stock of record April 20.

The New York, Chicago & St. Louis declared an extra dividend of $1.25 per share on the common stock, payable out of other income, for the first quarter of the year 1926, payable April 15 to stock of record March 31.

The following statement was issued after the meeting of the Chesapeake & Ohio board:

In connection with the declaration of a semi-annual dividend of $2 a share on the common stock on May 19, 1925, the directors authorized a statement to the stockholders explaining in substance that in the opinion of the directors they were not warranted in increasing the dividend rate so long as the proposed unification plan was pending before the Interstate Commerce Commission.

Reference was made in such statement to the mutual obligations of the several corporations participating in the unification plan insofar as their respective values and usefulness to the unification were concerned.

It must be remembered that if, all things considered, the Chesapeake & Ohio could now afford to increase the dividend upon the common stock the money retained through failure to increase such dividend remains in the treasury of the company subject to dividend declaration. As the declaration of dividends is a matter in the discretion of the directors we trust that all stockholders will feel that such discretion will be exercised in a manner which will evidence not only the rights of the company's stockholders, but the company's obligations under agreements formally approved by the directors and stockholders.

In view of the rejection by the Interstate Commerce Commission of some financial features of the unification plan and the decision of the deposit plan committee to return to the holders of certificates of deposit the stock represented thereby, pending any further proceedings under the plan, and further, in view of the statement above referred to, the board of directors of the railway company declared the special dividend aforesaid.

In determining the amount of such dividends the directors feel that they have given full and proper consideration to previous earnings and to present earnings and conditions.

Minority stockholders of the Chesapeake & Ohio have requested the directors of the company to call upon the Van Sweringen interests to reimburse the company for all expenses incurred by the Chesapeake & Ohio in the Nickel Plate merger proceedings.

DENVER & RIO GRANDE WESTERN.—*Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $1,725,000 5 per cent equipment trust certificates, to be sold to Kuhn, Loeb & Co., and Blair & Co., Inc., at 99.25. The proceeds are to be used in acquiring equipment to the amount of $2,300,000, including 200 automobile cars, 500 steel gondola cars, and 3 Mountain type locomotives.

DE QUEEN & EASTERN.—*Final Value.*—The Interstate Commerce Commission has found the final value for rate-making purposes, as of 1918, to be $532,120.

FLORIDA EAST COAST.—*Bonds Authorized.*—The Interstate Commerce Commission has authorized the issuance of $15,000,000 first and refunding mortgage 5 per cent bonds, series A, to be sold to J. P. Morgan & Co. at 95, the proceeds to be used for the extension of the company's facilities.

Bonds Sold.—J. P. Morgan & Co., the First National Bank of New York and the National City Company have sold $15,000,000 first and refunding mortgage 5 per cent bonds, series A, at 98. The bonds are dated September 1, 1924, and mature in 1974. They are redeemable on 90 days' notice as follows: On and after September 1, 1944, at 105 and accrued interest and on and after September 1, 1971, at par. Details concerning the issue have been given as follows:

The first and refunding mortgage is a direct first lien on 240 miles of road (including 17 miles under construction), and a second lien on 616 miles, subject only to $12,000,000 first (closed) mortgage 4½ per cent bonds, making the total mileage under the mortgage 856 miles.

The proceeds of these bonds are to be u ed for additions and improvements to the company's property, including approximately 136 miles of new second main track, automatic block signals on 196 miles of the main line, and additions to freight yards, engine terminals and car shops. This new construction will complete the provisions of double track and automatic block signals on the entire 346 miles of main line between Jacksonville and Miami, and, it is estimated, will increase the present carrying capacity of the line by at least 150 per cent.

When these improvements are completed, more than $110,000,000 cash, including the proceeds of these bonds, will have been spent upon the construction and improvement of the property, as contrasted with a total outstanding funded debt, including this issue, of $63,800,000.

During the nine years shown in the above table, the company's income available for fixed charges averaged $3,110,116 annually, or 3.46 times the average annual amount of such charges. The income available for fixed charges in 1925, without any benefit from the improvements and additions to be provided by the proceeds of this issue, amounted to nearly twice the annual interest requirements on the company's funded debt to be outstanding after the issuance of these bonds.

The company's net income available for dividends in 1925 was equivalent to over 10.24 per cent on the $37,500,000 par value of capital stock outstanding.

GEORGIA, FLORIDA & ALABAMA.—*New Control.*—This company which operates a line from Carrabelle, Fla., to Richland, Ga., 181 miles with a branch from Havana, Fla., to Quincy, 11 miles, total 192 miles, has passed to the control of a group of New York bankers headed by Freeman & Co. The company has no funded debt and its outstanding capital stock totals $2,118,000. A dividend on this stock of 4 per cent was paid in 1905, 5 per cent in 1906 and none since. A statement issued on behalf of the bankers said:

"Because of the road's favorable trunk line connections and its position with respect to important developments in western Florida, it is expected that application will be made to the Intersate Commerce Commission before long, covering new exensions for the road which will give it the shortest line, with its connections, from the western coast of Florida to Northern and Central States territory. No public offering or other new financing is contemplated at the present time."

HOCKING VALLEY.—*Dividends Increased.*—See Chesapeake & Ohio.

INDIANA HARBOR BELT.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,600,000 of capital stock to reimburse the treasury for expenditures from current income.

KANSAS CITY SOUTHERN.—*Bonds Sold.*—Ladenburg, Thalman & Co. and the National City Company have sold at 100½ $10,000,000 Texarkana & Fort Smith first mortgage 5½ per cent bonds, series A, due August 1, 1950, guaranteed principal and interest by the Kansas City Southern. The purpose of the issue is to pay off the outstanding issue of general first mortgage bonds and to reimburse the treasury of the Texarkana & Fort Smith for expenditures made for additions and betterments. The details concerning the issue included the following notation of future plans of the Kansas City Southern.

The Kansas City Southern occupies an important strategic position among the railroads of the Southwest, and recently has strengthened this position through the acquisition of substantial interests in the Missouri-Kansas-Texas and in the St. Louis Southwestern, with a view to the formation, subject to the approval of the Interstate Commerce Commission, of a greater railway system in the Southwest in furtherance of the policy of Congress as expressed in the Transportation Act.

The Interstate Commerce Commission approval of this issue was reported in the *Railway Age* of March 6.

LONG ISLAND.—*Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $1,230,000 of 4½ per cent equipment trust certificates, to be sold to Kuhn, Loeb & Co., at 97.

MACON & BIRMINGHAM.—*Application for Abandonment.*—The receivers have applied to the Interstate Commerce Commission for authority for the abandonment of its line from Sofkee to La Grange, Ga., 96.6 miles, over which operation was abandoned in 1922 by court authority.

MARION & EASTERN.—*Acquisition by Missouri Pacific.*—Announcement was made at Marion, Ill., on March 11, that a contract had been consummated providing for the purchase by the Missouri Pacific of sufficient stock to control the Marion & Eastern which operates from Marion, Ill., to Paulton, 12½ miles. The Missouri Pacific already owns $100,000 of the company's first mortgage bonds.

MISSOURI-ILLINOIS.—*Notes.*—The Interstate Commerce Commission has granted authority for the issuance of $300,000 promissory notes, to be used with cash from the treasury to pay off its entire funded debt of $492,000 7 per cent first mortgage bonds. The bonds will be retired on August 15, 1926; they are due February 15, 1931. The promissory notes pay 6 per cent interest, and will be dated August 1, 1926, payable on demand.

MISSOURI-KANSAS-TEXAS.—*Dividend Increase.*—Directors of the Missouri-Kansas-Texas, on March 15, declared a quarterly dividend of $1.50 on the preferred stock, payable May 1 to stockholders of record April 15. This has the effect of placing the issue on a 6 per cent basis. Dividends on the preferred stock have been paid at the rate of 5 per cent since February 2, 1925, and are to be 7 per cent cumulative after January 1, 1928.

NEW YORK, CHICAGO & ST. LOUIS.—*Extra Dividend.*—See Chesapeake & Ohio.

Plan to Return Shares Deposited for Merger.—O. P. and M. J. Van Sweringen made an announcement on March 16 that, in view of the recent decision of the Interstate Commerce Commission denying approval of their plan for the formation of an enlarged Nickel Plate system, they would return the stock deposited under the plan if the certificates of deposit are surrendered on or before

(*Continued on page 882*)

Annual Report

Forty-First Annual Report of the Buffalo, Rochester & Pittsburgh Railway Company, for Year Ending December 31st, 1925

The Directors of the Buffalo, Rochester and Pittsburgh Railway Company submit to the Stockholders the following report for the year ending December 31, 1925.

Road Operated

	1925 Miles	1924 Miles	Increase
Owned	369.71	369.71	
Leased	102.25	90.30	11.95
Trackage rights	130.00	130.00	
Total length of road operated	601.96	590.01	11.95
Second track	211.88	211.88	
Sidings	468.42	466.02	2.40
Total miles of all tracks, all steel rail	1,282.26	1,267.91	14.35

The increase of road operated is due to 11.95 miles of additional line purchased by the Allegheny & Western Railway Company and included in its lease to your Company.

Sidings were increased 2.40 miles.

Income

Operating Income:	1925	1924	Increase or Decrease
Revenues	$16,560,780.90	$15,951,853.12	$608,927.78
Expenses	13,690,728.92	13,451,122.39	239,606.53
Net revenue	$2,870,051.98	$2,500,730.73	$369,321.25
Tax accruals	$487,000.00	$407,000.00	$80,000.00
Uncollectible revenues	9,015.46	932.41	8,083.05
	$496,015.46	$407,932.41	$88,083.05
Total operating income	$2,374,036.52	$2,092,798.32	$281,238.20
Non-operating income	795,537.88	1,035,431.65	—239,893.77
Gross income	$3,169,574.40	$3,128,229.97	$41,344.43
Deductions for interest, rentals, etc.	2,507,978.35	2,506,346.63	1,631.72
Net income—surplus available for dividends	$661,596.05	$621,883.34	$39,712.71
Return on capital stock	4.01%	3.77%	.24%

Taxes advanced 19.66% to $487,000 due to the full assessment this year of the Federal Income tax. For the two preceding years the Federal Income taxes assessed were offset by the application of the deficits incurred in 1921 and 1922 as provided in the law.

Non-operating income decreased $239,893.77, due chiefly to the reduction of the balance in "Hire of Freight Cars" account caused by the storage of coal cars in excess of traffic requirements.

The net income for the year is $661,596.05, an increase of $39,712.71 over the preceding year, and is equal to 4.01 per cent. on both classes of stock.

Dividends

Dividends were paid in cash on:

			1925		1924
Preferred stock	$6,000,000	6%	$360,000	6%	$360,000
Common stock	10,500,000	4%	420,000	4%	420,000
Total	$16,500,000		$780,000		$780,000

Since the close of the fiscal year your Board of Directors has declared a semi-annual dividend of three per cent. on the preferred stock and two per cent. on the common stock, payable February 15th, 1926.

Capital Stock

There has been no change during the year in this account. The total outstanding capital stock of the Company amounts to $16,500,000, and consists of $6,000,000 preferred stock and of $10,500,000 common stock.

Funded Debt

With the approval of all governmental authorities and in accordance with the provisions of the Consolidated Mortgage of 1907, the trustee delivered to the Company during the year $1,186,000 Consolidated 4½% mortgage bonds, which were all placed in the Treasury.

The following bonds were retired during the year:

Equipment Agreement Series	G	$177,000.00
"	H	125,000.00
"	J	100,000.00
"	K	80,000.00
"	L	128,000.00
"	10	133,600.00
Total		$743,600.00

There are now in the Treasury of the Company $3,536,000 unpledged Consolidated 4½% mortgage bonds.

Cost of Road

Capital account was charged during the year with $231,980.56 for investment in roads, as follows:

Assessment, Broad Street, Rochester, N. Y.	$25,064.65
New siding, Reed Glass Company, Rochester, N. Y.	3,442.91
New siding, Ebsary Gypsum Company, Wheatland, N. Y.	8,627.26
Automatic flashing light crossing signals, Pavilion, N. Y.	1,395.36
Elimination of grade crossing, Silver Lake Junction, N. Y.	19,778.12
Overhead bridge, Carrollton, N. Y.	4,478.99
Steel water tank, Bradford, Pa.	2,822.06
Additional shop facilities, Clarion Junction, Pa.	1,396.52
New yard tracks, Johnsonburg, Pa.	29,145.60
Air storage reservoirs, Du Bois, Pa.	6,043.47
Increased weight of rail, etc.	87,646.92
Increased ballast	33,213.34
Miscellaneous	8,925.36
Total	$231,980.56

All important work in progress and undertaken during the year was practically completed.

Cost of Equipment

Expenditures were made for additions to equipment as follows:

Ten work equipment cars purchased	$3,643.60
Four miscellaneous equipment cars purchased	2,603.29
Sundry betterments, including reclassification of 5 freight train cars	63,644.62
	$69,891.51

There was credited for equipment sold, transferred or destroyed, the following book values:

Four locomotives	$58,578.79	
Automatic train control device from five freight locomotives	7,985.91	
Two hundred and forty-five freight train cars	185,088.67	
Seventeen work equipment cars	8,063.76	
Four miscellaneous equipment cars	3,017.73	262,734.86
Making a net credit of		$192,843.35

Four of the lighter type locomotives, displaced by the heavy modern power purchased in 1923, were sold during the year. In addition one hundred and fourteen gondola cars, two cabooses and three miscellaneous equipment cars were sold.

The rolling stock statistics are affected as follows:

The total tractive power of engines now aggregates 14,637,809 pounds, a decrease of 78,458 pounds during the year.

The average tractive power of each engine increased 72 pounds, being 49,958 pounds, as against 49,886 pounds a year ago.

The total carrying capacity of cars in freight service now amounts to 681,690 net tons, a decrease of 10,760.

The average carrying capacity or efficiency of each freight car increased .05 net tons, being 44.96 tons as against 44.91 tons last year.

Of the cars in passenger service, 58.25 per cent. are of all steel construction, and in the freight service, 99.17 per cent. of the cars are all steel, or are equipped with steel underframes.

The following table indicates the relative changes in equipment for the past ten years:

	Tractive power of engines in pounds		Capacity of cars in freight service in tons of 2,000 pounds	
	Average of each engine	Aggregate tractive power	Average for each car	Aggregate capacity
1916	36,257	11,493,536	43.25	750,847
1917	39,060	12,773,410	43.37	737,327
1918	43,312	16,025,362	43.94	777,657
1919	44,100	15,346,830	43.97	771,541
1920	45,630	14,281,845	44.12	748,215
1921	46,400	13,688,103	44.20	737,255
1922	46,630	13,522,696	44.37	727,382
1923	49,700	14,810,676	44.63	705,525
1924	49,886	14,716,267	44.91	692,450
1925	49,958	14,637,809	44.96	681,690
Increase over 1916	13,701	3,144,273	1.71	(Dec.) 69,157
Per cent.	37.79	27.36	3.95	(Dec.) 9.21

Passenger Revenues

The gross passenger revenue amounted to $1,442,158.05, a decrease of 11.44 per cent. or $186,214.00 against the same period in 1924.

[Advertisement]

The diversion of local traffic to automobile and bus service, together with the continued inactivity in the coal mining regions during the greater part of the year, were the principal causes of this unfavorable result.

The average rate received per passenger per mile decreased .065 cent, being 3.073 cents as compared with 3.138 cents the preceding year.

The average distance each passenger was carried increased 1.7 miles, being 34.2 miles against 32.5 miles.

Passengers carried in 1925	1,371,900	
Passengers carried in 1924	1,597,160	
A decrease of 14.10 per cent. or		225,260
Passengers carried one mile in 1925	46,935,307	
Passengers carried one mile in 1924	51,900,115	
A decrease of 9.57 per cent, or		4,964,808

Freight Revenues

The gross freight revenue amounted to $14,314,885.91, an increase of 5.45 per cent., or $739,307.78 compared with 1924.

The average rate received per ton per mile decreased .015 cent, being .903 cent compared with .918 cent for the same period in 1924.

The average distance each ton was hauled increased 4.71 miles, being 153.82 miles, against 149.11 miles last year.

The bituminous coal tonnage increased 112,322 tons or 2.36% as compared with 1924.

The decrease in coke tonnage, pig and bloom iron was due to the closing down of the blast furnaces on the line of the road.

The iron ore tonnage increased 28,998 tons or 36.40 per cent., due to the furnaces laying in stocks for future use.

The volume of all other freight is the largest in the history of the Company, showing an increase of 400,805 tons or 8.59 per cent.

The revenue tonnage moved was as follows:

	1925	1924	Increase	Decrease
Bituminous coal	4,877,437	4,765,115	112,322	.....
Coke	109,313	253,619	.....	144,306
Iron ore	108,657	79,659	28,998	.....
Pig and bloom iron	142,382	157,072	.....	14,690
Other freight	5,066,412	4,665,607	400,805	.....
Total	10,304,201	9,921,072	.....	.....
An increase of 3.86 per cent, or			383,129	.....
Tons moved one mile in 1925				1,585,036,538
Tons moved one mile in 1924				1,479,310,868
An increase of 7.15 per cent, or				105,725,670

The average number of revenue tons carried one mile per revenue freight train mile, excluding the mileage of helping engines, increased 19.91 tons, being 756.29 tons against 736.38 tons a year ago.

The average number of revenue tons carried one mile per revenue freight engine mile including the mileage of helping engines, increased 7.67 tons, being 522.85 tons against 515.18 tons a year ago.

The averages for the past ten years are as follows:

	Train load	Engine load
Year ending June 30, 1916	786	502
Six months ending December 31, 1916	792	510
Year ending December 31, 1917	836	545
1918	943	602
1919	884	586
1920	943	602
1921	754	520
1922	790	534
1923	850	554
1924	736	515
1925	756	523
Decrease under 1916	30 (Increase)	21
Per cent	3.82 (Increase)	4.18

The non-revenue freight traffic, not included in any other figures of this report, is as follows:

	1925	1924
Number of tons	845,781	755,706
Number of tons carried one mile	78,781,315	64,145,298

Expenses

Operating Expenses increased $239,606.53 or 1.78 per cent., as follows:

	Increase	Decrease	Per cent
Maintenance of way	$386,814.71	.....	22.57
Maintenance of equipment	.....	$156,412.10	3.34
Traffic	18,081.41	.....	5.88
Transportation	.....	10,296.48	.17
Miscellaneous operations	418.59	.....	1.42
General	3,801.19	.....	.78
Transportation for investment, Cr.	.....	2,800.79	20.83
Total	$239,606.53	.....	1.78

The principal increases were in the Maintenance of Way Department, due to a larger maintenance program, in the Traffic Department account of establishment of additional off-line agencies, and in the expenditures of the Valuation Bureau, included in General Expenses.

Eighty per cent. of the ties in main track and important branches, and sixty-two per cent. of all ties in the tracks maintained by your Company are creosoted.

A reduction of 32,161 miles was made in passenger train service between points where the public patronage had become negligible.

During the year an average of 3,628 coal cars in excess of requirements and 31 locomotives ready for service, were stored on the line.

Consistent with our obligation to give adequate and efficient transportation, economies were strictly enforced in all departments.

The operating ratio was again decreased, and is lower than for any year since 1917.

The percentage of each group of operating expenses to the operating revenue for the past seven years, is as follows:

	1925	1924	1923	1922	1921	1920	1919
Maintenance of way	12.68	10.74	17.77	14.28	13.75	16.58	16.95
Maintenance of equipment	27.34	29.36	32.14	38.85	34.18	31.05	37.73
Traffic	1.97	1.93	1.40	1.42	1.50	1.03	1.26
Transportation	37.62	39.12	38.29	40.07	43.33	45.98	48.73
Miscellaneous operations	.18	.18	.15	.17	.21	.17	.20
General	2.98	3.07	2.33	2.83	3.38	2.46	2.82
Transp. for Inv. Cr.	.10	.08	.48	.09	.01	.06	....
	82.67	84.32	91.60	97.53	96.34	97.21	107.69

The average cost per ton mile is .718 cent, a decrease of .036 cent from last year.

General Remarks

At special meetings of the stockholders of the Delaware & Hudson Company and the Buffalo, Rochester & Pittsburgh Railway Company, held in September 1925, a lease of your property to the Delaware & Hudson Company was authorized for a period of 999 years from January 1st, 1926. The terms of the lease provide for net rental equivalent to six per cent (6%) per annum on all the outstanding preferred and common stock of the Buffalo, Rochester & Pittsburgh Railway Company and the payment of all fixed charges and maturing debts. The lease will be effective as soon as the necessary approval of the public authorities has been obtained.

Since the close of the fiscal year the Interstate Commerce Commission issued, on February 10, 1926, a tentative valuation of the property of your Company and its leased lines. The values determined as of June 30, 1917, were as follows: carrier's property for "rate-making purposes" $57,529,352; non-carrier property $1,893,357; total valuation $59,422,709. This amount exceeds by $6,786,794 the total capitalization of your Company and its leased lines on that date, taking the outstanding stocks and bonds at par.

Additions and betterments to the property since June 30, 1917, not included in the above figures, amount to $12,743,022, making a total valuation of $72,165,731 on December 31, 1925, or $12,582,816 in excess of the present combined capitalization of stocks and bonds at par.

The value for "rate-making purposes" fixed by the Commission is based upon the estimated cost of reproduction new with prices as of June 30, 1914 (excepting land values as of June 30, 1917), less a deduction of 20.8%, or $13,000,000, for theoretical depreciation. Protest will be filed with the Commission on March 15, 1926, calling particular attention among other objections to the erroneous application of June 30, 1914, prices to a valuation of June 30, 1917, and taking exceptions to the deduction for depreciation.

The cost of valuation work on your Company's properties to date has reached $310,337.69 of which $69,005.20 was assumed by the U. S. Railroad Administration.

The Ontario Car Ferry Company, Limited, paid a dividend of 5% for the year ending December 31, 1924. The sum of $12,500 received on the $250,000 of this Company's stock was credited to Non-operating Income account. The dividends paid by the following Water Companies:

Ketner Water Co.	$92,000 stock @ 9%	$8,280.00
Kyle Water Co.	85,000 stock @ 12%	10,200.00

were also credited to the same account.

The acknowledgments of the Board are renewed to its officers and loyal employees for their faithful and efficient service.

By order of the Board,

WILLIAM T. NOONAN,
President.

Rochester, N. Y., February 20, 1926.

[ADVERTISEMENT]

(*Continued from page 879*)

May 1, 1926. Notice to the holders of certificates of deposit was issued by the law firm of White & Case on behalf of the Van Sweringen brothers and is signed by John P. Murphy, secretary of the committee organized for the purpose of receiving deposits of the stock. The notice read as follows:

Pursuant to direction of the committee, I wish to notify you of the adoption of the following resolutions:

RESOLVED, That in view of the decision of the Interstate Commerce Commission, and pending any further proceedings under the plan, the committee considers it for the best interests of the depositors to return to any holder or holders of certificates of deposit desiring the same the stock represented thereby, upon surrender to the depositary of such certificates of deposit, duly endorsed, on or before May 1, 1926.

RESOLVED, That the committee does hereby authorize J. P. Morgan & Co., the depositary, to accept the surrender of any and all certificates of deposit presented to it on or before May 1, 1926, duly endorsed, and return to the holder or holders of such certificates of deposit the stock represented thereby or other certificates of stock for the same number and kind of shares.

All depositors desiring to take advantage of the above resolutions may present their certificates of deposit to the depositary, J. P. Morgan & Co., 23 Wall street, New York City, or to the following named sub-depositaries on or before May 1, 1926: The Union Trust Company, East Ninth street and Euclid avenue, Cleveland, Ohio; Continental and Commercial Trust and Savings Bank, 208 South La Salle street, Chicago; Old Colony Trust Company, 17 Court street, Boston.

All certificates of deposit presented for surrender must be duly endorsed in blank or accompanied by proper instruments of assignment in blank for transfer, and properly witnessed.

OKLAHOMA & RICH MOUNTAIN.—*Stock Authorized.*—The Interstate Commerce Commission has authorized the issuance of $100,000 common stock to be sold at par and the proceeds used to assist in the construction of a line from Page, Okla., to Talihina, 35 miles.

PITTSBURGH & WEST VIRGINIA.—*Non-Voting Stock.*—Counsel for this company, in a memorandum filed with the Interstate Commerce Commission, has submitted additional arguments in support of that road's application for authority to change the par value of its common stock and to convert a portion thereof into preferred stock without voting rights, in view of the commission's recent decision in the Nickel Plate merger case in which the commission expressed disapproval of the idea of issuing non-voting stock. The brief says:

"We do not understand that the commission has decided that under no circumstances will it approve the issue of preferred stock with limitations upon voting rights. We assume that the commission will decide each case as it arises on its particular facts and circumstances, as it did in approving the issuance of preferred stock with limited voting power in the first Nickel Plate consolidation case, and still more recently in approving the $16,000,000 preferred stock issue of the Denver & Rio Grande Western. This case involves the interest of only one group of stockholders, substantially all of whom have approved the proposed plan. It seems to the applicant that a denial of the present application made after it had built the property up, would be penalizing it for its conservatism and would be a discouragement to like conservative methods of reorganization in the future."

SHIPPERS' CAR LINE CORPORATION.—*Stock Sold.*—Freeman & Co. and Stroud & Co., Inc., have sold 17,000 shares of new 7 per cent cumulative preferred stock of the Shippers' Car Line Corporation. Announcement of the sale of these shares was the first notice that the American Car & Foundry Company had purchased all of the outstanding class B shares of the Shippers' Car Line Corporation, which company has been organized to acquire all the property and assets of the Shippers' Car Line Corporation. The new preferred stock was sold in the form of units of 10 shares of preferred and 2 shares of class A common at a price of $1,025 plus accrued dividends on the preferred shares from March 1. R. H. Davenport, president of the Shippers' Car Line Corporation has summarized the purpose of the new financing as follows:

"This financing has enabled the Shippers' Car Line Corporation, recently incorporated under the laws of the State of New York, to acquire all the property and assets of the Shippers' Car Line, Inc., a New York corporation incorporated in 1918, and all the issued stock of the American Welding Company, a Delaware corporation, successor to the American Welding Company of Carbondale, Pa., incorporated in 1906, and the outgrowth of a business established over twenty-five years ago.

Shippers' Car Line Corporation, directly or through its wholly owned subsidiary, American Welding Company, is engaged in the buying, selling and leasing of tank cars, in the merchant and structural steel lines, and in the manufacture of welded tanks and containers for the transportation of chemicals and other liquid commodities, operates a line of 1,040 steel tank cars and owns modern and well equipped manufacturing plants at Milton, Pa., and Carbondale, Pa.

R. H. Davenport, for many years manager of the tank car department of the American Car & Foundry Company, and president of Shippers' Car Line, Inc., since its organization, will continue as president of the new corporation. The Board of Directors is as follows: R. H. Davenport, president, Shippers' Car Line Corporation; W. C. Dickerman, vice president, American Car & Foundry Company; Wm. M. Hager, assistant to president, American Car & Foundry Company; W. J. Harris, general purchasing agent, American Car & Foundry Company; Ernest L. Nye, Freeman & Co.; Edward B. Robinette, Stroud & Co., Inc.; Herbert W. Wolff, vice president, American Car & Foundry Company.

Details of the issue follow:

After dividends upon the preferred stock the holders of the class A stock are entitled to receive out of each year's net profits, as determined by the directors, non-cumulative dividends up to dividends at the rate of $2 per share per annum, before any dividends to the class B stock. Thereafter, class A and class B shares shall participate equally per share in any further dividend declaration for such year until the class A shares shall have received dividends in the aggregate for such year at the rate of $3 per share per year. Class A shares are redeemable at the option of the Company in whole or in part at any time after June 1, 1929, at $40.00 per share. Voting rights are vested exclusively in the class B stock, except for certain voting rights of the Preferred Stock in the event of default in dividends exceeding seven per cent, and in proceedings to authorize certain classes of mortgages or of bond or stock issues. It is the intention of the directors of the Shippers' Car Line Corporation to commence the payment of dividends on the outstanding class A shares of the company at an early date at the rate of $2 per share per annum."

Following the new financing the outstanding capitalization of the Shippers' Car Line Corporation will include 17,000 shares of preferred, 35,000 shares of class A no-par-value stock and 35,000 shares of class B stock. Car trust obligations of the Shippers' Car Line, Inc., amounting to $1,030,000, have been assumed by the new company.

TENNESSEE CENTRAL.—*Securities.*—The Interstate Commerce Commission has authorized this company to issue 60,000 shares of common stock without par value in exchange for 30,000 shares of common stock of $100 par value; $500,000 of 7 per cent cumulative preferred stock to be sold to stockholders at 95; $1,500,000 first mortgage 6 per cent bonds to be sold to White, Weld & Co., at 95. It has also authorized the issuance of 10,000 shares of common stock without par value to be held for the conversion of 5,000 shares of preferred. The application as filed called for the preferred stock to be issued without voting power but the commission requires that the preferred stock shall have voting power. The company's present capitalization consists of $3,000,000 common stock, $3,000,000 long term debt, the latter including $1,500,000 bonds and $1,500,000 loaned by the United States Government; discount on capital stock is shown as $3,000,000. Upon completion of the plan the applicant will have outstanding 60,000 shares of no-par-value common and will have eliminated from its accounts the discount on capital stock; will have paid off a loan of $1,500,000 to the United States for the issue of a like amount of bonds and will have increased the capital account by $500,000 which amount will be represented by the new preferred. The company purposes to expend approximately $500,000 during the next two years for additions and betterments.

TEXAS & NEW ORLEANS.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon a branch line from Rockland, Tex., to Turpentine, 10.5 miles.

WICHITA FALLS, RANGER & FORT WORTH.—*Termination of Receivership.*—J. W. Mitchel of Fort Worth, receiver, and James A. Jackson, vice-president of the National City Bank of New York, announced at Fort Worth, on March 12, that arrangements had been completed for the termination of the receivership of this property on April 1. This company's line extends from Dublin, Tex., to Breckenridge, 67 miles and has been in receivership since December 26, 1921. It is said to be owned by the National City Bank and that that company would probably dispose of it. The traffic of the road is principally oil.

Dividends Declared

Cleveland, Cincinnati, Chicago & St. Louis.—Common, 1¾ per cent, quarterly; preferred, 1¾ per cent, quarterly; both payable April 20 to holders of record March 26.

Mahoning Coal Railroad.—Common, $12.50, quarterly, payable May 1 to holders of record April 14.

Manhattan Railway.—7 per cent (guaranteed), 1¾ per cent, quarterly, payable April 1 to holders of record March 22.

New York Central.—1¾ per cent, quarterly, payable May 1 to holders of record March 26.

Pere Marquette.—Common, 2 per cent, extra; common (additional, increasing quarterly rate to 1½ per cent), ½ per cent; both payable May 1 to holders of record April 15.

Southern Railway.—Common, 1¾ per cent, quarterly, payable May 1 to holders of record April 10. Preferred, 1¾ per cent, quarterly, payable April 15 to holders of record March 25.

West Jersey & Seashore.—3 per cent. semi-annually, payable April 1 to holders of record March 16.

Western Pacific.—Preferred, $1.50, quarterly, April 3 to holders of record March 23.

Average Price of Stocks and Bonds

	Mar. 16	Last Week	Last Year
Average price of 20 representative railway stocks	90.95	91.21	80.27
Average price of 20 representative railway bonds	95.96	95.15	90.52

Railway Officers

Executive

A. N. Williams, general manager of the Midland Valley, with headquarters at Muskegon, Okla., has been appointed to the staff of the president of the Minneapolis, St. Paul & Sault Ste. Marie, on special assignments, with headquarters at Minneapolis, Minn.

A. S. Ingalls, who has been promoted to assistant vice-president of the New York Central, lines west of Buffalo, with headquarters at Cleveland, Ohio, was born on February 27, 1874, and was graduated from Harvard University in 1896. He entered railway service in June of that year as a clerk on the Cleveland, Cincinnati, Chicago & St. Louis, and was promoted to assistant superintendent in February, 1898. Mr. Ingalls was promoted to division superintendent in February, 1901, and held that position until June, 1907, when he was promoted to assistant general superintendent of the Lake Shore & Michigan Southern, now a part of the New York Central. In January, 1910, he was transferred to the lines east of Toledo, his headquarters remaining at Cleveland. Mr. Ingalls was promoted to general superintendent, with the same headquarters, in June, 1911, and in January, 1915, when the consolidation of the Lake Shore & Michigan Southern with the New York Central was effected, was appointed general superintendent of the Third district of the New York Central, with headquarters at Cleveland. He was promoted to assistant general manager in May, 1916, and in February, 1917, was promoted to general manager of the lines west of Buffalo. He held that position until his recent promotion to assistant vice-president.

A. S. Ingalls

Operating

O. L. Young has been appointed superintendent of terminals of the St. Louis-San Francisco, with headquarters at Birmingham, Ala., succeeding **G. R. Carson,** retired.

The jurisdiction of **Frank Wood,** general transportation inspector of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., has been extended over the entire eastern lines. The jurisdiction of **O. B. Davis,** general transportation inspector of the Western district of the eastern lines, has been extended to include the Eastern district also.

W. R. Petty, general yardmaster of the Carondelet yard of the Missouri Pacific, with headquarters at St. Louis, Mo., has been promoted to assistant superintendent of the St. Louis Terminal division, with jurisdiction over the operation of the Carondelet yard, the East Ivory boat yard, and the river transfer, with the same headquarters, a newly created position.

J. B. Briscoe, assistant superintendent of the Plains division of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex., has been promoted to acting superintendent of the Panhandle division, with headquarters at Wellington, Kan., succeeding H. R. Lake, promoted. **C. S. Cravens** has been appointed assistant superintendent of the Plains division in place of Mr. Briscoe.

A. D. Edgar, superintendent of the Central and the Lehigh & Susquehanna divisions of the Central of New Jersey, with headquarters at Jersey City, N. J., has been granted a leave of absence on account of sickness. **C. H. English,** assistant superintendent, has been appointed acting superintendent; **A. R. Young,** passenger trainmaster, has been appointed acting assistant superintendent; and **W. L. Vanderhoof,** assistant trainmaster, has been appointed acting passenger trainmaster.

R. E. Laidlaw has been appointed superintendent of the Detroit division and passenger terminals of the Michigan Central, with headquarters at Detroit, Mich., succeeding **M. T. Wright,** who has been granted a leave of absence on account of ill health. **G. C. MacDonald** has been appointed acting superintendent of the Northern division, with headquarters at Bay City, Mich. **G. E. Salisbury** has been appointed trainmaster of the Northern division, with headquarters at Bay City, Mich., and **O. F. McIsaac** has been appointed assistant trainmaster of the Northern division, with headquarters at Grayling, Mich.

D. R. MacBain, who has been promoted to general manager of the New York Central, lines west of Buffalo, with headquarters at Cleveland, Ohio, was born on October 23, 1861, at Queenston Heights, Ont., and entered railway service in October, 1876, as a machinist's apprentice on the Canadian Southern, now a part of the Canadian National. He was promoted to locomotive fireman in May, 1878, and in 1882 was promoted to locomotive engineer. Mr. MacBain was appointed traveling engineer on the Canada division of the Michigan Central in 1890, and three years later was transferred to the district west of the Detroit river. He was promoted to master mechanic of the Western division in July, 1900, and in April of the following year was transferred to St. Thomas, Ont. He was transferred to Jackson, Mich., in January, 1902, and remained there until July, 1906, when he was promoted to assistant superintendent of motive power, with headquarters at Detroit. Mr. MacBain was transferred to the New York Central, with headquarters at Albany, N. Y., in April, 1908, and in May, 1910, was promoted to superintendent of motive power of the Lake Shore & Michigan Southern, the Lake Erie & Western, the Lake Erie, Alliance & Wheeling, the Dunkirk, Allegheny Valley & Pittsburgh, the Cleveland Short Line, the Chicago, Indiana & Southern and the Indiana Harbor Belt. He was promoted to assistant general manager of the lines west of Buffalo, with headquarters at Cleveland, in June, 1919, and held that position until his recent promotion to general manager.

D. R. MacBain

Traffic

Thomas D. Elliott has been appointed general agent for the Boston & Maine, with headquarters at Cleveland, Ohio, succeeding **Irving N. Doe,** promoted.

William J. Sheridan has been promoted to general western freight agent of the Buffalo, Rochester & Pittsburgh, with headquarters at Chicago, Ill., with supervision over Detroit and Chicago territories.

G. W. Agnew, general western agent of the Georgia & Florida, with headquarters at Detroit, Mich., has been appointed general agent of the Chicago & Eastern Illinois, with headquarters at Memphis, Tenn., succeeding **H. A. Perkins,** who has resigned.

Charles E. McCullough, division passenger agent of the Pennsylvania, with headquarters at New York City, has been promoted to assistant general passenger agent, with headquarters at Washington, D. C., a newly created position. **C. P. Brodie,** district passenger representative, with headquarters at Newark, N. J., has been promoted to division passenger agent at New York, succeeding Mr. McCullough.

Mechanical

B. L. Butler has been appointed water service and fuel supervisor of the Southern Pacific, with headquarters at Dunsmuir, Cal., to succeed J. B. Duncan, Jr., resigned.

J. H. Reisse, mechanical inspector of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been appointed mechanical assistant to the vice-president, with the same headquarters.

The position of marine superintendent of the Long Island has been abolished, and **H. L. Des Anges** has been appointed engineer of floating equipment, with headquarters at Long Island City, reporting to the superintendent of motive power.

L. R. Christy, general car inspector of the Missouri Pacific, with headquarters at St. Louis, Mo., has been promoted to master car builder of the Gulf Coast Lines and the International Great Northern, with headquarters at Houston, Tex., a newly created position.

Engineering, Maintenance of Way and Signaling

B. T. Anderson has been appointed superintendent of signals of the Hocking Valley, with headquarters at Richmond, Va.

J. E. Davison, assistant to the chief engineer of the Canadian National, with headquarters at Winnipeg, Manitoba, has been appointed district engineer of the Manitoba district, with the same headquarters, to succeed **A. V. Redmond,** deceased.

H. J. Armstrong, general superintendent of transportation and maintenance of way of the Missouri & North Arkansas, with headquarters at Harrison, Ark., has been promoted to chief engineer, with the same headquarters, a newly created position.

Obituary

H. G. Hetzler, president of the Chicago & Western Indiana and the Belt Railway of Chicago, with headquarters at Chicago, died at his home in that city on March 13, after an illness of three months. Mr. Hetzler was stricken with paralysis last December. He was born in 1862 and was graduated from the University of Michigan in 1886. He entered railway service in that year as assistant civil engineer on the Chicago, Burlington & Quincy and in 1891 was appointed engineer maintenance of way of the Louisville, New Albany & Chicago. Mr. Hetzler returned to the Burlington in 1892 as roadmaster at Chicago, and held that position until 1898, when he was promoted to superintendent of freight terminals, with the same headquarters. In 1903 he was promoted to superintendent of the Chicago division, resigning in May, 1905, when he was elected president of the Metropolitan West Side Elevated Railroad in Chicago. Mr. Hetzler was elected president of the Chicago & Western Indiana and the Belt Railway of Chicago in February, 1910, which position he held until his death, with the exception of the period of federal control when he was successively general manager and federal manager of the same roads. Mr. Hetzler was active in the affairs of the Young Men's Christian Association, being a director of the Chicago association at the time of his death, and a former treasurer.

H. G. Hetzler

W. L. Rohbock, chief engineer of the Wheeling & Lake Erie, with headquarters at Cleveland, Ohio, was found dead in his office in that city on Sunday, March 14.

James J. Storrow, senior member of the banking firm of Lee, Higginson & Co., Boston, Mass., and a leader in civic affairs in New England, died in a New York hotel on March 13. Mr. Storrow was chairman of the New England governor's railroad committee, appointed in 1923, to study railroad conditions in that section and which prepared under Mr. Storrow's direction the elaborate and much discussed report recommending regional consolidation in New England.

William H. Finley, formerly president of the Chicago & North Western, who resigned in June, 1925, died at his home at Wheaton, Ill., on March 17, from pneumonia. Mr. Finley was taken sick only the day prior to his death, his illness being attributed to exposure at the funeral of H. G. Hetzler, late president of the Chicago & Western Indiana, on March 15. Since his resignation as president of the North Western, Mr. Finley has practiced as a consulting engineer at Chicago. He has been particularly active in technical societies, being a member of the American Society of Civil Engineers, the Franklin Institute, the American Association of Engineers and the Western Society of Engineers, having been a past president of the last two. Mr. Finley was born on January 22, 1862, in New Castle county, Del., and was educated in the public schools and by private instruction. He entered railway service in October, 1887, as a draftsman on the Chicago, Milwaukee & St. Paul. Four years later he was promoted to assistant engineer and placed in charge of designing in the bridge and building department. Mr. Finley entered the service of the Chicago & North Western in 1892, as engineer of bridges, which position he held for 10 years. In 1902 he was promoted to principal assistant engineer and four years later to assistant chief engineer. He was promoted to chief engineer in 1913 and was elected president of the corporation in 1918, assuming the active presidency of the property at the end of federal control.

W. H. Finley

Safety Committees of the Southern Pacific received from employees during 1925 a total of 4,469 suggestions designed to correct unsafe practices and conditions. Of these suggestions 3,248 were adopted. A total of 1,184 foremen in charge of work crews established records of complete freedom from reportable accidents throughout the year.

The Cleveland, Cincinnati, Chicago & St. Louis is showing the average cost of its trains in a series of advertisements published in newspapers along its lines. The figures show that the ordinary eight-car passenger train represents an investment of $309,000, while the cost per mile of tracks, buildings and right-of-way is $84,000 more. A locomotive and tender cost $60,000; a combination mail and express car $23,000; a baggage car, $19,000; two day coaches, $28,000 each; a diner, $56,000; a sleeping car, $35,000; two parlor cars $30,000, making a total of $309,000.